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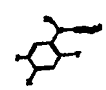
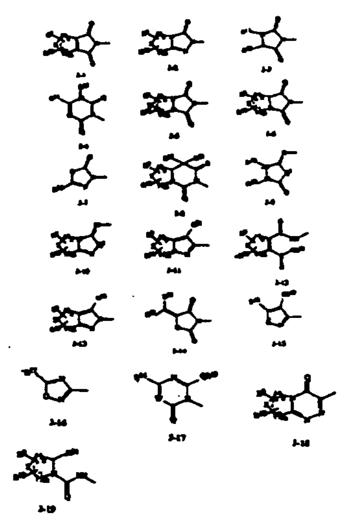
(54) Title: HERBICIDAL SULFONAMIDES

(57) Abstract

Compounds of formula (I), and their N-oxides and agriculturally suitable salts, are disclosed which are useful for controlling undesired vegetation. In said formula (I) J is J-1 - J-19, R^2 is C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, C_1-C_6 haloalkyl, C_3-C_6 cycloalkyl, C_3-C_6 halocycloalkyl, C_2-C_6 alkoxyalkyl, C_2-C_6 haloalkoxyalkyl, C_2-C_6 alkenyl, C_2-C_6 haloalkenyl, C_3-C_6 alkoxyalkenyl, C_2-C_6 alkynyl, C_2-C_6 haloalkynyl, C_2-C_6 cyanoalkyl, C_1-C_6 nitroalkyl, $(CH_2)_p$-OR^6, $CH=CH(CH_2)_q$-OR^6, $C\equiv C(CH_2)_q$-OR^6, C_2-C_6 alkylthioalkyl, C_2-C_6 alkylsulfinylalkyl, C_2-C_6 alkylsulfonylalkyl, C_3-C_8 alkoxycarbonylalkyl, C_3-C_8 alkylcarbonyloxyalkyl or oxiranyl optionally substituted with 1-3 C_1-C_3 alkyl; also disclosed are compositions containing the compounds of formula (I) and a method for controlling undesired vegetation which involves contacting the vegetation or its environment with an effective amount of a compound of formula (I).


(I)



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TITLE

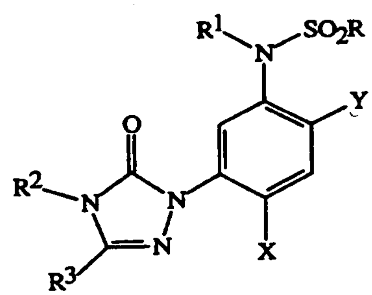
HERBICIDAL SULFONAMIDES

BACKGROUND OF THE INVENTION

This invention relates to certain sulfonamides, their *N*-oxides, agriculturally suitable salts and compositions, and methods of their use for controlling undesirable vegetation.

The control of undesired vegetation is extremely important in achieving high crop efficiency. Achievement of selective control of the growth of weeds especially in such useful crops as rice, soybean, sugar beet, corn (maize), potato, wheat, barley, tomato and plantation crops, among others, is very desirable. Unchecked weed growth in such useful crops can cause significant reduction in productivity and thereby result in increased costs to the consumer. The control of undesired vegetation in noncrop areas is also important. Many products are commercially available for these purposes, but the need continues for new compounds which are more effective, less costly, less toxic, environmentally safer or have different modes of action.

U.S. 4,818,275 discloses herbicidal acyclic sulfonamides of the formula



wherein, *inter alia*

X and Y are Br, Cl or F;

R is alkyl, haloalkyl or dialkylamino;

R^1 is H, Na, lower alkyl or SO_2R;

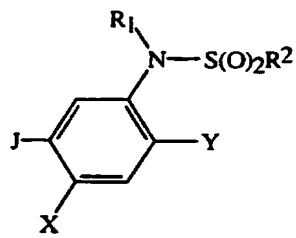
R^2 is alkyl, haloalkyl or lower alkoxy; and

R^3 is halogen, alkyl or haloalkyl.

The sulfonamides of the present invention are not disclosed therein.

SUMMARY OF THE INVENTION

This invention is directed to compounds of Formula I including all geometric and stereoisomers, *N*-oxides, and agriculturally suitable salts thereof, agricultural compositions containing them and their use for controlling undesirable vegetation:



I

wherein

X is H, F or Cl;

Y is F, Cl, Br, cyano, nitro, C_1-C_3 haloalkyl, C_1-C_3 alkoxy, C_1-C_3 haloalkoxy or $C(S)NH_2$;

R^1 is H, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 alkenyl, C_3-C_6 haloalkenyl, C_3-C_6 alkynyl, C_3-C_6 haloalkynyl, C_2-C_6 alkoxyalkyl, C_2-C_6 haloalkoxyalkyl, formyl, C_2-C_{20} alkylcarbonyl, C_4-C_7 cycloalkylcarbonyl, C_2-C_6 haloalkylcarbonyl, C_2-C_6 alkoxycarbonyl, C_3-C_6 alkoxyalkylcarbonyl, C_2-C_6 haloalkoxycarbonyl, C_3-C_6 cycloalkyl, C_3-C_6 halocycloalkyl, C_4-C_7 cycloalkylalkyl, C_4-C_7 halocycloalkylalkyl, $S(O)_2R^2$, $C(O)SR^3$, $C(O)NR^4R^5$ or benzoyl;

R^2 is C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, C_1-C_6 haloalkyl, C_3-C_6 cylcloalkyl, C_3-C_6 halocycloalkyl, C_2-C_6 alkoxyalkyl, C_2-C_6 haloalkoxyalkyl, C_2-C_6 alkenyl, C_2-C_6 haloalkenyl, C_3-C_6 alkoxyalkenyl, C_2-C_6 alkynyl, C_2-C_6 haloalkynyl, C_2-C_6 cyanoalkyl, C_1-C_6 nitroalkyl, $(CH_2)_p$-OR^6, $CH{=}CH(CH_2)_q$-OR^6, $C{\equiv}C(CH_2)_q$-OR^6, C_2-C_6 alkylthioalkyl, C_2-C_6 alkylsulfinylalkyl, C_2-C_6 alkylsulfonylalkyl, C_3-C_8 alkoxycarbonylalkyl, C_3-C_8 alkylcarbonyloxy-alkyl or oxiranyl optionally substituted with 1-3 C_1-C_3 alkyl;

R^3 is H, C_1-C_3 alkyl or C_1-C_3 haloalkyl; or R^3 is phenyl optionally substituted with C_1-C_3 alkyl, 1-3 halogen, 4-5 fluorine, 1-2 nitro, C_1-C_3 alkoxy or CF_3;

R^4 is H, C_1-C_3 alkyl or C_1-C_3 haloalkyl; or R^4 is phenyl optionally substituted with C_1-C_3 alkyl, 1-3 halogen, 4-5 fluorine, 1-2 nitro, C_1-C_3 alkoxy or CF_3;

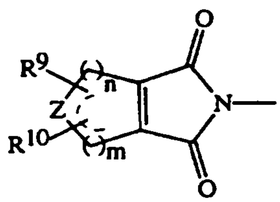
R^5 is C_1-C_3 alkyl or C_1-C_3 haloalkyl; or

R^4 and R^5 are taken together as $-CH$-CH_2-, $-CH_2CH_2CH_2$-, $-CH_2CH_2CH_2CH_2$-, $-CH_2CH_2CH_2CH_2CH_2$- or $-CH_2CH_2OCH_2CH_2$-;

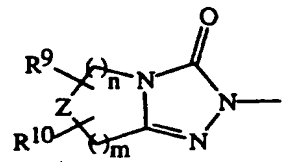
R^6 is C_1-C_3 alkylsulfonyl, C_1-C_3 haloalkylsulfonyl or $P(=O)(OR^7)(OR^8)$; or R^6 is phenylsulfonyl optionally substituted with C_1-C_6 alkyl, 1-3 halogen, 4-5 fluorine, C_1-C_6 alkoxy, CF_3 or C_2-C_4 alkylcarbonyl;

R^7 and R^8 are each independently H, C_1-C_3 alkyl or C_1-C_3 haloalkyl;

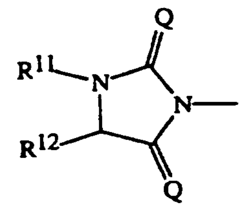
J is



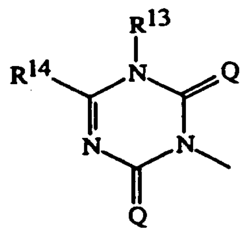
J-1



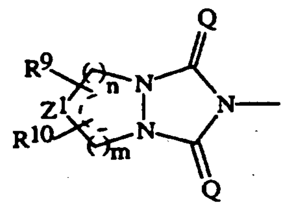
J-2



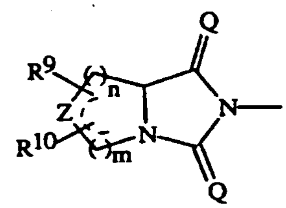
J-3



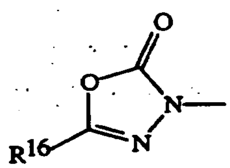
J-4



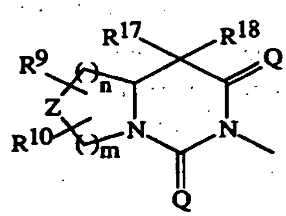
J-5



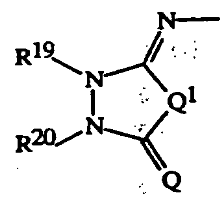
J-6



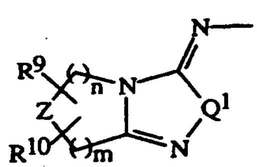
J-7



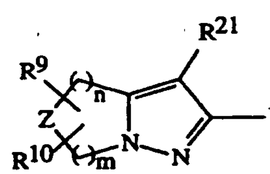
J-8



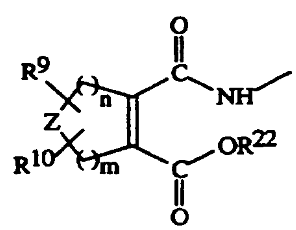
J-9



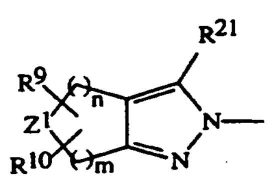
J-10



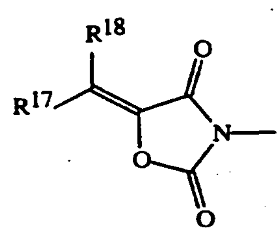
J-11



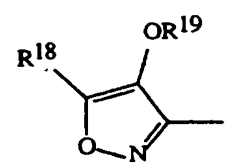
J-12



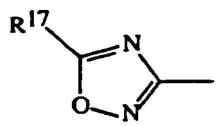
J-13



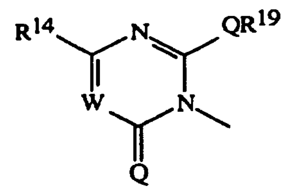
J-14



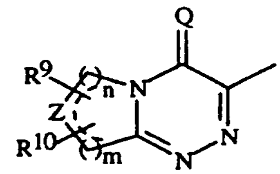
J-15



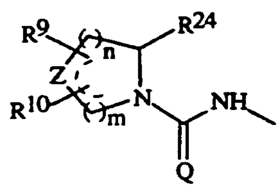
J-16



J-17



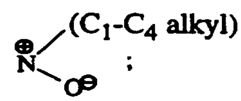
J-18

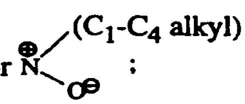


J-19

wherein the dashed line in J-1, J-5, J-6, J-18, and J-19 indicates that the left-hand ring contains only single bonds or one bond in the ring is a carbon-carbon double bond;

m and n are each independently 0, 1, 2 or 3, provided that m + n is 2 or 3;

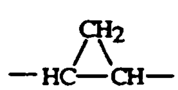
Z is CR^9R^{10}, O, S, S(O), $S(O)_2$, N(C_1-C_4 alkyl) or  ;

Z^1 is CR^9R^{23}, O, S, S(O), $S(O)_2$, N(C_1-C_4 alkyl) or  ;

each R^9 is independently H, C_1-C_6 alkyl, halogen, hydroxy, C_1-C_6 alkoxy, C_1-C_6 haloalkyl, C_1-C_6 haloalkoxy, C_2-C_6 alkylcarbonyloxy or C_2-C_6 haloalkylcarbonyloxy;

each R^{10} is independently H, C_1-C_6 alkyl, hydroxy or halogen; or

when R^9 and R^{10} are bonded to adjacent carbon atoms they can be taken together with the carbons to which they are attached to form

 optionally substituted with at least one member selected from 1-2 halogen and 1-2 C_1-C_3 alkyl;

each R^{11} is independently H, C_1-C_6 alkyl, C_3-C_6 alkenyl, C_1-C_6 haloalkyl or C_2-C_6 alkoxyalkyl;

R^{12} is H, halogen, C_1-C_6 alkyl, C_3-C_6 alkenyl, C_1-C_6 haloalkyl or C_2-C_6 alkoxyalkyl;

R^{13} is H, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 alkenyl, C_3-C_6 haloalkenyl, C_3-C_6 alkynyl, C_3-C_6 haloalkynyl, HC(=O), C_2-C_5 alkylcarbonyl or $N(R^{11})_2$;

R^{14} is C_1-C_6 alkyl, C_1-C_6 alkylthio, C_1-C_6 haloalkyl or $N(CH_3)_2$;

W is N or CR^{15};

R^{15} is H, C_1-C_6 alkyl or halogen; or R^{15} is phenyl optionally substituted with C_1-C_6 alkyl, 1-3 halogen, 4-5 fluorine, C_1-C_6 alkoxy or CF_3;

R^{16} is C_1-C_6 alkyl, halogen or C_1-C_6 haloalkyl;

R^{17} and R^{18} are each independently H, C_1-C_6 alkyl or C_1-C_6 haloalkyl;

R^{19} and R^{20} are each independently C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 alkenyl, C_3-C_6 haloalkenyl, C_3-C_6 alkynyl or C_3-C_6 haloalkynyl;

R^{21} is H, halogen, cyano, C_1-C_3 alkoxy or C_1-C_3 haloalkoxy;

R^{22} is C_1-C_6 alkyl or C_1-C_6 haloalkyl; or R^{22} is phenyl optionally substituted with C_1-C_6 alkyl, 1-3 halogen, 4-5 fluorine, 1-2 nitro, C_1-C_6 alkoxy or CF_3;

R^{23} is C_1-C_3 alkyl, hydroxy or halogen;

R^{24} is cyano or $C(Q)R^{25}$;

R^{25} is OR^{26} or $NR^{27}R^{28}$;

R^{26} is C_1-C_6 alkyl or C_1-C_6 haloalkyl;

each R^{27} is independently H or C_1-C_6 alkyl;

R^{28} is H, C_1-C_6 alkyl, C_1-C_6 alkoxy or $NR^{27}R^{29}$; or

R^{27} and R^{28} can be taken together as $-CH_2CH_2-$, $-CH_2CH_2CH_2-$, $-CH_2CH_2CH_2CH_2-$, $-CH_2CH_2CH_2CH_2CH_2-$ or $-CH_2CH_2OCH_2CH_2-$;

R^{29} is H, C_1-C_3 alkyl, C_2-C_4 alkylcarbonyl, C_2-C_4 alkoxycarbonyl or C_1-C_3 alkylsulfonyl;

Q is independently O or S;

Q^1 is O or S;

p is 1, 2 or 3; and

q is 0, 1, 2 or 3;

provided that,

(a) when J is J-5, X is F, Y is Cl, R^1 is H, Q is O, R^9 and R^{10} are H, Z^1 is O, n is 2, and m is 1, then R^2 is other than CF_3;

(b) when J is J-6, X is F, Y is Cl, R^1 is H, Q is O, R^9 and R^{10} are H, Z is CHCl or CHBr, n is 1, and m is 1, then R^2 is other than CF_3;

(c) when J is J-8, X is F, Y is Cl, R^1 is H, R^{17} and R^{18} are H, Q is O, R^9 and R^{10} are H, Z is CH_2, and (m+n) is 2 or 3, then R^2 is other than CF_3;

(d) when J is J-8, X is F, Y is Cl, R^1 is H, R^{17} and R^{18} are H, Q is O, R^9 and R^{10} are H, Z is O, n is 1, and m is 2, then R^2 is other than CF_3; and

(e) when J is J-11, X is F, Y is Cl, R^1 is H, R^{21} is Cl, R^9 and R^{10} are H, Z is CH_2, and (m+n) is 3, then R^2 is other than CF_3.

In the above recitations, the term "alkyl", used either alone or in compound words such as "alkylthio" or "haloalkyl" includes straight-chain or branched alkyl, such as, methyl, ethyl, *n*-propyl, *i*-propyl, or the different butyl, pentyl or hexyl isomers. The term "1-2 alkyl" indicates that one or two of the available positions for that substituent may be alkyl which are independently selected. "Alkenyl" includes straight-chain or branched alkenes such as vinyl, 1-propenyl, 2-propenyl, and the different butenyl, pentenyl and hexenyl isomers. "Alkenyl" also includes polyenes such as 1,2-propadienyl and 2,4-hexadienyl. "Alkynyl" includes straight-chain or branched alkynes such as ethynyl, 1-propynyl, 2-propynyl and the different butynyl, pentynyl and hexynyl isomers. "Alkynyl" can also include moieties comprised of multiple triple bonds such as 2,5-hexadiynyl. "Alkoxy" includes, for example, methoxy, ethoxy, *n*-propyloxy, isopropyloxy and the different butoxy, pentoxy and hexyloxy isomers. "Alkoxyalkyl" denotes alkoxy substitution on alkyl. "Alkoxyalkoxy" denotes alkoxy substitution on alkoxy. Examples of "alkoxyalkyl" include CH_3OCH_2, $CH_3OCH_2CH_2$, $CH_3CH_2OCH_2$, $CH_3CH_2CH_2CH_2OCH_2$ and $CH_3CH_2OCH_2CH_2$. "Alkylthio" includes branched or straight-chain alkylthio moieties such as methylthio, ethylthio, and the different propylthio, butylthio, pentylthio and hexylthio isomers. "Alkylthioalkyl" denotes alkylthio substitution on alkyl. Examples of "alkylthioalkyl" include CH_3SCH_2, $CH_3SCH_2CH_2$, $CH_3CH_2SCH_2$, $CH_3CH_2CH_2CH_2SCH_2$ and $CH_3CH_2SCH_2CH_2$. "Alkylsulfinyl" includes both enantiomers of an alkylsulfinyl group. Examples of "alkylsulfinyl" include $CH_3S(O)$, $CH_3CH_2S(O)$, $CH_3CH_2CH_2S(O)$, $(CH_3)_2CHS(O)$ and the different butylsulfinyl, pentylsulfinyl and hexylsulfinyl isomers. Examples of "alkylsulfonyl" include $CH_3S(O)_2$, $CH_3CH_2S(O)_2$, $CH_3CH_2CH_2S(O)_2$, $(CH_3)_2CHS(O)_2$ and the different butylsulfonyl, pentylsulfonyl and hexylsulfonyl isomers. "Cyanoalkyl" denotes an alkyl group substituted with one cyano group. Examples of "cyanoalkyl" include $NCCH_2$, $NCCH_2CH_2$ and $CH_3CH(CN)CH_2$. "Alkylamino", "dialkylamino", and the like, are defined analogously to the above examples. "Cycloalkyl" includes, for example, cyclopropyl, cyclobutyl, cyclopentyl, and cyclohexyl. One skilled in the art will appreciate that not all nitrogen containing heterocycles can form *N*-oxides since the nitrogen requires an available lone pair for oxidation to the oxide; one skilled in the art will recognize those nitrogen containing heterocycles which can form *N*-oxides.

The term "halogen", either alone or in compound words such as "haloalkyl", includes fluorine, chlorine, bromine or iodine. The term "1-2 halogen" indicates that one or two of the available positions for that substituent may be halogen which are independently selected. Further, when used in compound words such as "haloalkyl", said alkyl may be partially or fully substituted with halogen atoms which may be the same or different. Examples of "haloalkyl" include F_3C, $ClCH_2$, CF_3CH_2 and

CF_3CCl_2. The terms "haloalkenyl", "haloalkynyl", "haloalkoxy", and the like, are defined analogously to the term "haloalkyl". Examples of "haloalkenyl" include $(Cl)_2C{=}CHCH_2$ and $CF_3CH_2CH{=}CHCH_2$. Examples of "haloalkynyl" include $HC{\equiv}CCHCl$, $CF_3C{\equiv}C$, $CCl_3C{\equiv}C$ and $FCH_2C{\equiv}CCH_2$. Examples of "haloalkoxy" include CF_3O, CCl_3CH_2O, $HCF_2CH_2CH_2O$ and CF_3CH_2O. Examples of "haloalkylthio" include CCl_3S, CF_3S, CCl_3CH_2S and $ClCH_2CH_2CH_2S$. Examples of "haloalkylsulfinyl" include $CF_3S(O)$, $CCl_3S(O)$, $CF_3CH_2S(O)$ and $CF_3CF_2S(O)$. Examples of "haloalkylsulfonyl" include $CF_3S(O)_2$, $CCl_3S(O)_2$, $CF_3CH_2S(O)_2$ and $CF_3CF_2S(O)_2$. Examples of "haloalkoxyalkoxy" include CF_3OCH_2O, $ClCH_2CH_2OCH_2CH_2O$, $Cl_3CCH_2OCH_2O$ as well as branched alkyl derivatives.

The total number of carbon atoms in a substituent group is indicated by the "C_i-C_j" prefix where i and j are numbers from 1 to 20. For example, C_1-C_3 alkylsulfonyl designates methylsulfonyl through propylsulfonyl; C_2 alkoxyalkyl designates CH_3OCH_2; C_3 alkoxyalkyl designates, for example, $CH_3CH(OCH_3)$, $CH_3OCH_2CH_2$ or $CH_3CH_2OCH_2$; and C_4 alkoxyalkyl designates the various isomers of an alkyl group substituted with an alkoxy group containing a total of four carbon atoms, examples including $CH_3CH_2CH_2OCH_2$ and $CH_3CH_2OCH_2CH_2$. Examples of "alkylcarbonyl" include $C(O)CH_3$, $C(O)CH_2CH_2CH_3$ and $C(O)CH(CH_3)_2$. Examples of "alkoxycarbonyl" include $CH_3OC({=}O)$, $CH_3CH_2OC({=}O)$, $CH_3CH_2CH_2OC({=}O)$, $(CH_3)_2CHOC({=}O)$ and the different butoxy- or pentoxycarbonyl isomers. In the above recitations, when a compound of Formula I is comprised of one or more heterocyclic rings, all substituents are attached to these rings through any available carbon or nitrogen by replacement of a hydrogen on said carbon or nitrogen.

When a compound is substituted with a substituent bearing a subscript that indicates the number of said substituents can exceed 1, said substituents (when they exceed 1) are independently selected from the group of defined substituents. Further, when the subscript indicates a range, e.g., $(R)_{i-j}$, then the number of substituents may be selected from the integers between i and j inclusive.

When a group contains a substituent which can be hydrogen, for example R^1 or R^{13}, then, when this substituent is taken as hydrogen, it is recognized that this is equivalent to said group being unsubstituted.

Compounds of this invention can exist as one or more stereoisomers. The various stereoisomers include enantiomers, diastereomers, atropisomers and geometric isomers. One skilled in the art will appreciate that one stereoisomer may be more active and/or may exhibit beneficial effects when enriched relative to the other stereoisomer(s) or when separated from the other stereoisomer(s). Additionally, the skilled artisan knows how to separate, enrich, and/or to selectively prepare said stereoisomers. Accordingly, the present invention comprises compounds selected from Formula I, *N*-oxides and

agriculturally suitable salts thereof. The compounds of the invention may be present as a mixture of stereoisomers, individual stereoisomers, or as an optically active form.

The salts of the compounds of the invention include acid-addition salts with inorganic or organic acids such as hydrobromic, hydrochloric, nitric, phosphoric, sulfuric, acetic, butyric, fumaric, lactic, maleic, malonic, oxalic, propionic, salicylic, tartaric, 4-toluenesulfonic or valeric acids. The salts of the compounds of the invention also include those formed with organic bases (e.g., pyridine, ammonia, triethylamine or dicyclohexylamine) or inorganic bases (e.g., hydrides, hydroxides, or carbonates of sodium, potassium, lithium, calcium, magnesium or barium) when the compound contains an acidic group such as a carboxylic acid or an amide.

Preferred compounds for reasons of better activity and/or ease of synthesis are:

Preferred 1. Compounds of Formula I above, and *N*-oxides and agriculturally suitable salts thereof, wherein:

X is F or Cl;

Y is F, Cl or Br;

R^1 is H, C_1-C_6 alkyl, C_3-C_6 cycloalkyl, C_3-C_6 alkenyl, C_3-C_6 alkynyl, C_1-C_6 haloalkyl, C_2-C_6 alkoxyalkyl, C_3-C_6 haloalkenyl, C_3-C_6 alkoxyalkylcarbonyl, C_2-C_6 alkylcarbonyl, C_2-C_6 alkoxycarbonyl, $S(O)_2R^2$ or $C(O)NR^4R^5$;

R^2 is C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, C_1-C_6 haloalkyl, C_3-C_6 cylcloalkyl, C_3-C_6 halocycloalkyl, C_2-C_6 alkoxyalkyl or C_2-C_6 haloalkoxyalkyl;

J is J-5, J-6, J-11, J-17 or J-19;

Z is CR^9R^{10}, O, S or $N(C_1$-C_4 alkyl);

each R^9 is independently H, halogen or C_1-C_6 haloalkoxy;

each R^{10} is independently H, hydroxy or halogen;

each Q is O;

Z^1 is CR^9R^{23}, O, S or $N(C_1$-C_4 alkyl); and

R^{23} is halogen.

Preferred 2. Compounds of Preferred 1 wherein:

Y is F or Cl;

R^1 is H, C_1-C_6 alkyl, C_3-C_6 cycloalkyl, C_3-C_6 alkenyl, C_3-C_6 alkynyl, C_1-C_6 haloalkyl, C_2-C_6 alkoxyalkyl, C_3-C_6 haloalkenyl, C_2-C_6 alkylcarbonyl or C_2-C_6 alkoxycarbonyl;

R^2 is C_1-C_6 haloalkoxy, C_1-C_6 haloalkyl, C_3-C_6 halocycloalkyl, C_2-C_6 alkoxyalkyl or C_2-C_6 haloalkoxyalkyl;

Z is CR^9R^{10} or O; and

Z^1 is CR^9R^{23} or O.

Preferred 3. Compounds of Preferred 1 wherein:

J is J-19;

R^1 is H, C_1-C_6 alkyl, C_3-C_6 alkenyl, C_3-C_6 alkynyl, C_2-C_6 alkoxyalkyl, C_2-C_6 alkylcarbonyl or C_2-C_6 alkoxycarbonyl;

R^2 is C_1-C_6 haloalkyl;

R^9 is H;

R^{10} is hydroxy or halogen;

Z is CR^9R^{10};

n is 1; and

m is 1.

Preferred 4. Compounds of Preferred 2 wherein:

J is J-6; and

Z is CR^9R^{10}.

Most preferred are compounds of Preferred 4 selected from the group:

a) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide;

b) (6*S*-*cis*)-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]-*N*-[(chloromethyl)sulfonyl]acetamide;

c) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide;

d) (6*S*-*cis*)-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl)-*N*-[(chloromethyl)sulfonyl]acetamide;

e) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide monosodium salt;

f) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide monopotassium salt;

g) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide monosodium salt; and

h) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide monopotassium salt.

This invention also relates to herbicidal compositions comprising herbicidally effective amounts of the compounds of the invention and at least one of a surfactant, a solid diluent or a liquid diluent. The preferred compositions of the present invention are those which comprise the above preferred compounds.

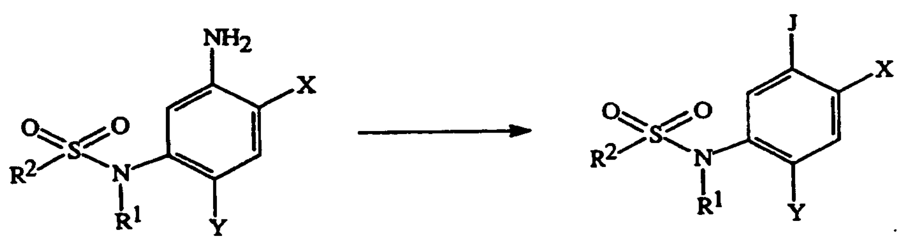
This invention also relates to a method for controlling undesired vegetation comprising applying to the locus of the vegetation herbicidally effective amounts of the compounds of the invention (e.g., as a composition described herein). The preferred methods of use are those involving the above preferred compounds.

DETAILS OF THE INVENTION

The compounds of Formula I can be prepared by one or more of the following methods and variations as described in Schemes 1-10. The definitions of X, Y, J, R^1-R^{29}, Z, Z^1, n, m, W, Q, Q^1, p, and q in the compounds of Formulae 1-23 below are as defined above in the Summary of the Invention. Compounds of Formulae Ia-If are various subsets of the compounds of Formula I, and all substituents for Formulae Ia-If are as defined above for Formula I.

Compounds of Formula I are prepared from the corresponding anilines of Formula 1 as represented in Scheme 1.

Scheme 1



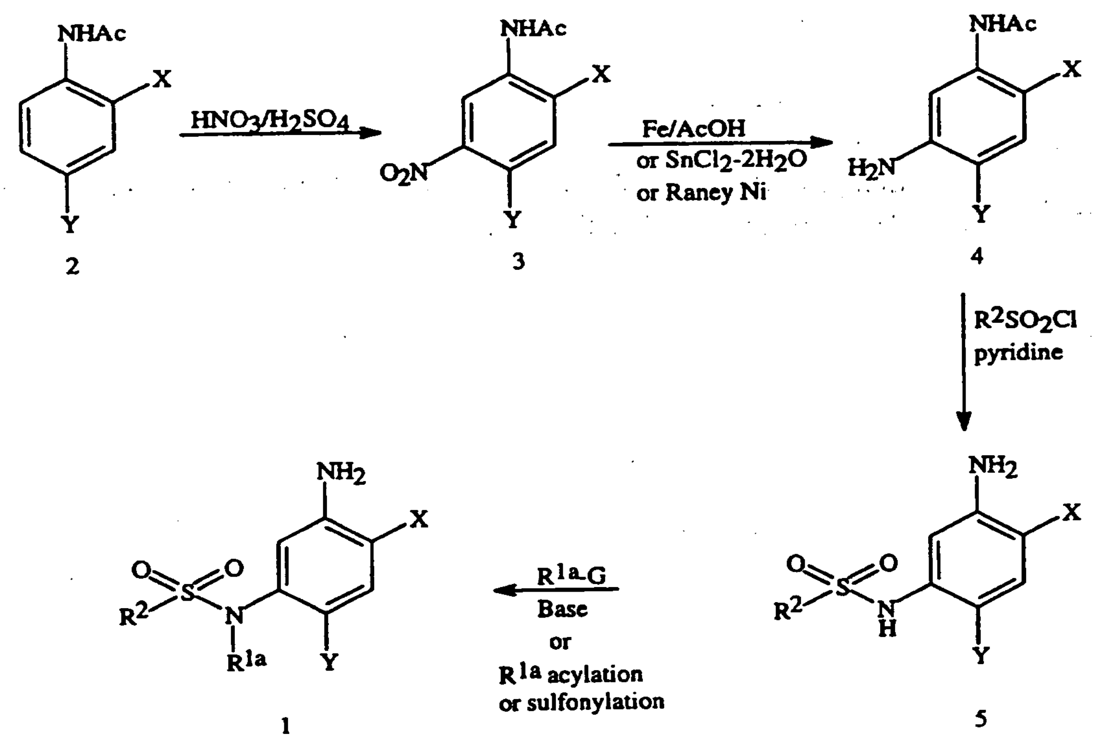
1 I

Synthesis of Anilines of Formula 1

Anilines of Formula 1 are prepared by the method illustrated in Scheme 2. Nitration of acetanilide 2 using a nitric acid/sulfuric acid mixture affords the nitro compound of Formula 3. Reduction of the nitro group affords the aniline of Formula 4. The aniline of Formula 4 is contacted with a sulfonyl chloride to give the sulfonamide of Formula 5. For compounds wherein R^1 is other than H, the sulfonamide nitrogen can be alkylated, acylated or sulfonylated to give the R^{1a}-substituted compound of Formula 1. The alkylation is performed using an alkyl halide or alkyl sulfonate in the presence of a base such as potassium carbonate, sodium methoxide, potassium

t-butoxide (*t*-BuOK) or sodium hydride in an anhydrous solvent such as dimethylformamide (DMF), tetrahydrofuran or acetonitrile at ambient temperature to 80 °C. Acylations to form the carbonyl-substituted sulfonamides are accomplished by condensing the sulfonamide of Formula 5 with the appropriate acylating agent, for example an acyl chloride, isocyanate or carbamoyl chloride. Sulfonylations to form the sulfonyl-substituted sulfonamides are accomplished in an analogous manner by reacting the sulfonamide of Formula 5 with the appropriate sulfonylating agent, for example a sulfonyl chloride.

Scheme 2

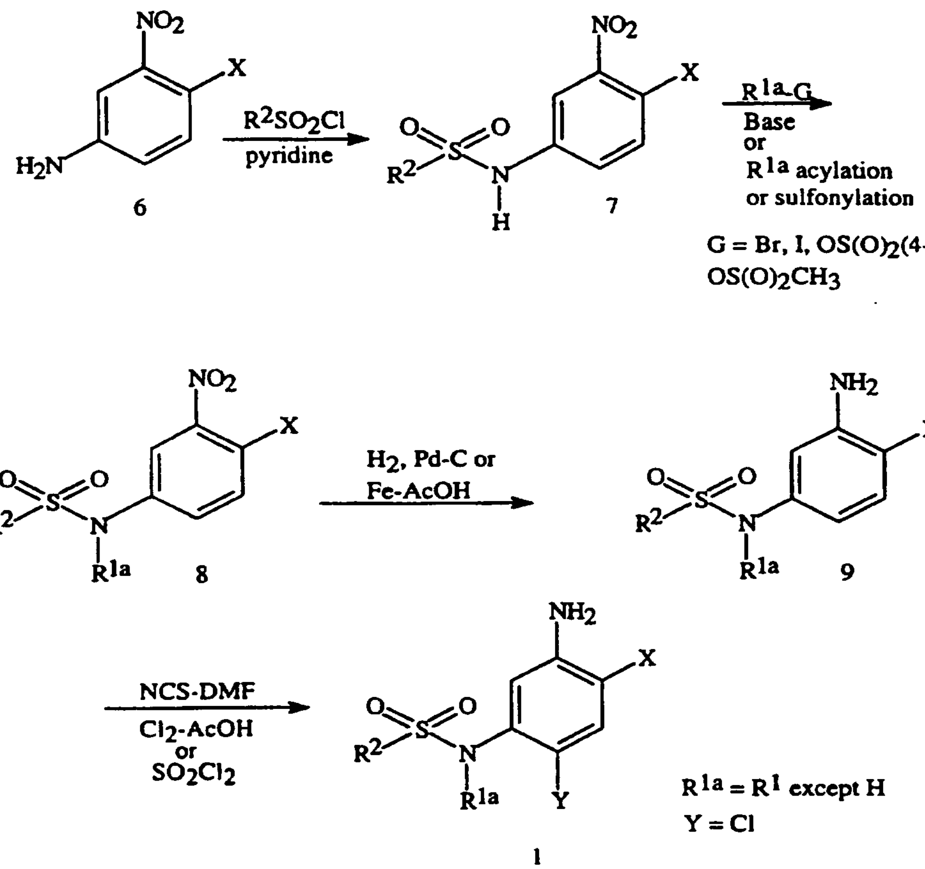


$R^{1a} = R^1$ except H

G = Br, I, $OS(O)_2(4\text{-}CH_3\text{-}Ph)$, $OS(O)_2CH_3$

Anilines of Formula 1 can also be prepared by the method illustrated in Scheme 3. The nitro aniline of Formula 6 is sulfonylated to afford the compound of Formula 7. Further alkylation, acylation or sulfonylation gives the nitro compound of Formula 8, which is reduced to the aniline of Formula 9. Chlorination of the phenyl ring provides the compound of Formula 1 wherein R^{1a} is R^1 as defined in the Summary of the Invention except H.

Scheme 3



Converting Anilines of Formula 1 to Compounds of Formula I

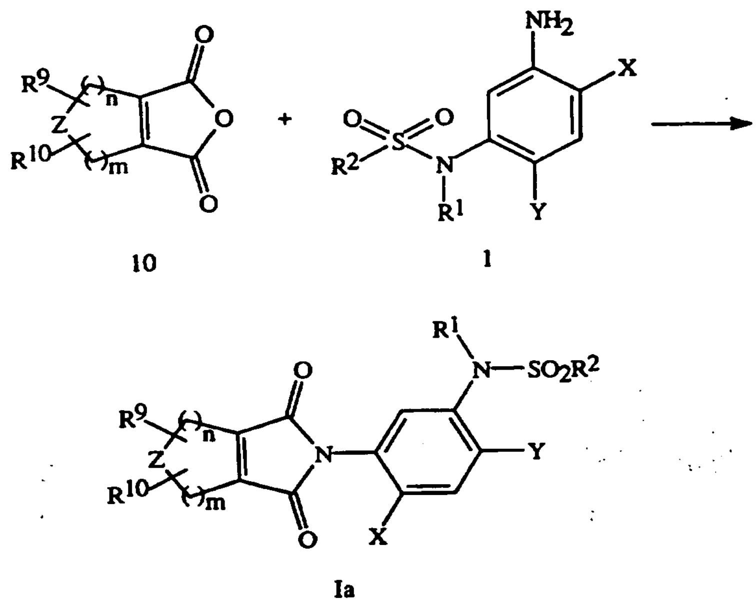
The anilines prepared by the methods outlined in Schemes 2 and 3 are used in the condensation with J group derivatives to form compounds of Formula I. In some instances, the anilines are used directly in the condensation reactions. In other instances and depending on the nature of the J-group, the NH_2 of the aniline is first converted to another functional group prior to condensation. For example, the aniline may be converted first to a hydrazine, an isocyanate or an aryl iodide. These methods are described in more detail below.

Direct Coupling with the Anilines

In some instances where the aniline is used directly, the compounds of Formula I are prepared by condensation of the aniline with an anhydride precursor to the J group. For example, as illustrated in Scheme 4, the anhydride of Formula 10 is condensed with

the aniline of Formula 1 to give compounds of Formula Ia wherein J = J-1. This method is disclosed in EP-A-170,191.

Scheme 4

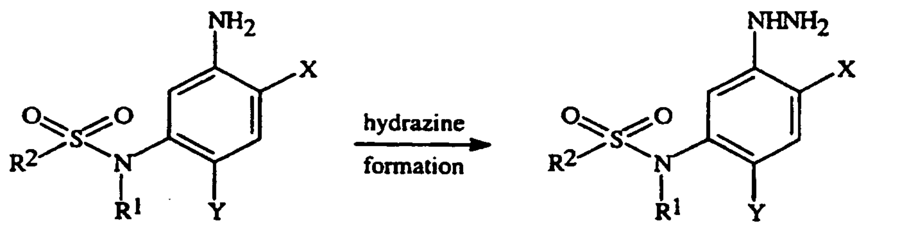


The anhydride of Formula 10 can be prepared by methods disclosed in EP 493,721, and WO 91/06216. Compounds of Formula I wherein J = J-8 and J-12 can be prepared using similar methodology. The aniline is condensed with the appropriate J-group anhydride, diester, or other bis-electrophile to form the compound of Formula I. The J-8 group precursor and the aniline condensation reaction are described in WO 94/03459. The J-12 group anhydride and the aniline condensation reaction are described in U.S. 4,003,926.

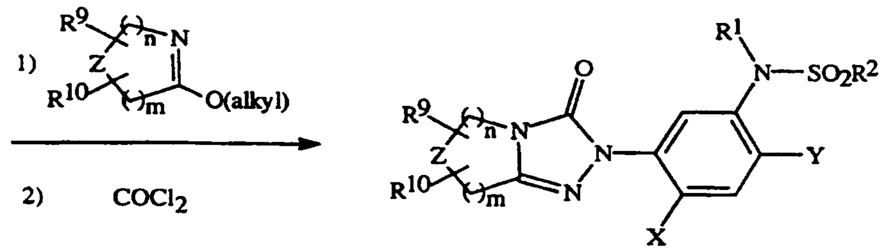
Hydrazines

For some compounds of Formula I, the appropriate aniline is first converted to the corresponding hydrazine, and then the hydrazine is condensed with the J-group derivative, or precursor thereof, to form the desired material. The conversion of an aniline of Formula 1 to a hydrazine of Formula 11 is illustrated in Scheme 5. Subsequent condensation of the hydrazine with the iminoether precursor to J-2 followed by cyclization with phosgene forms the sulfonamide of Formula Ib. The preparation of the iminoether J-2 precursor and the condensation procedure is described in U.S. 4,315,767.

Scheme 5



1 11



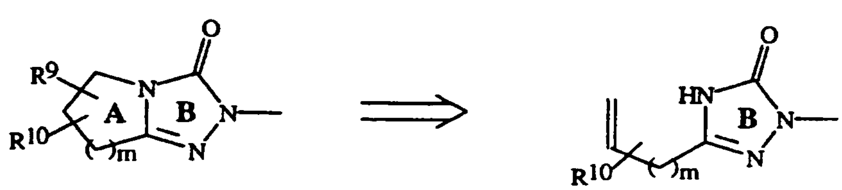
Ib

Anilines can be converted to the hydrazines by diazotization and then reduction as is well-known in the literature (for example, see U.S. 4,695,312).

Compounds of Formula I wherein J = J-7 are also prepared by first converting the aniline to the appropriate hydrazine, and then condensation with the appropriate J-group precursor. Methods for the preparation of the J-7 precursor and the condensation with a hydrazine are described in WO 92/12139 and U.S. 4,560,752.

The retrosynthetic analysis for the synthesis of the J-2 group is shown below in Scheme 6 for compounds of Formula I wherein J = J-2 and Z is CR^9R^{10}. The formation of ring A can be accomplished by intramolecular cyclization between the nitrogen in ring B and the terminal double bond of the triazolinone with the sulfonamide group already in place. The synthesis of the triazolinone ring B is known in the art and can be prepared by methods such as those described in U.S. 4,818,275 and U.S. 4,818,276.

Scheme 6



J-2

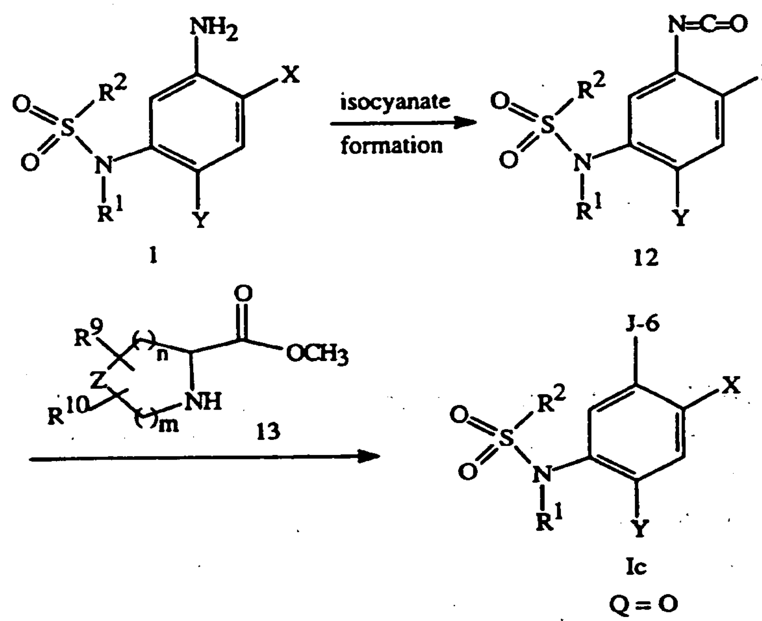
m = 1 or 2

Isocyanates

In some instances, the appropriate aniline is first converted to the corresponding isocyanate, and then the isocyanate is condensed with the J-group derivative, or precursor thereof, to form compounds of Formula I. In Scheme 7, the conversion of

aniline of Formula 1 to isocyanate of Formula 12 is illustrated. Subsequent condensation of the isocyanate with the aminoester of Formula 13 followed by cyclization forms the sulfonamide of Formula Ic. The preparation of some aminoester precursors to J-6 and the condensation procedure are described in U.S. 4,179,276.

Scheme 7

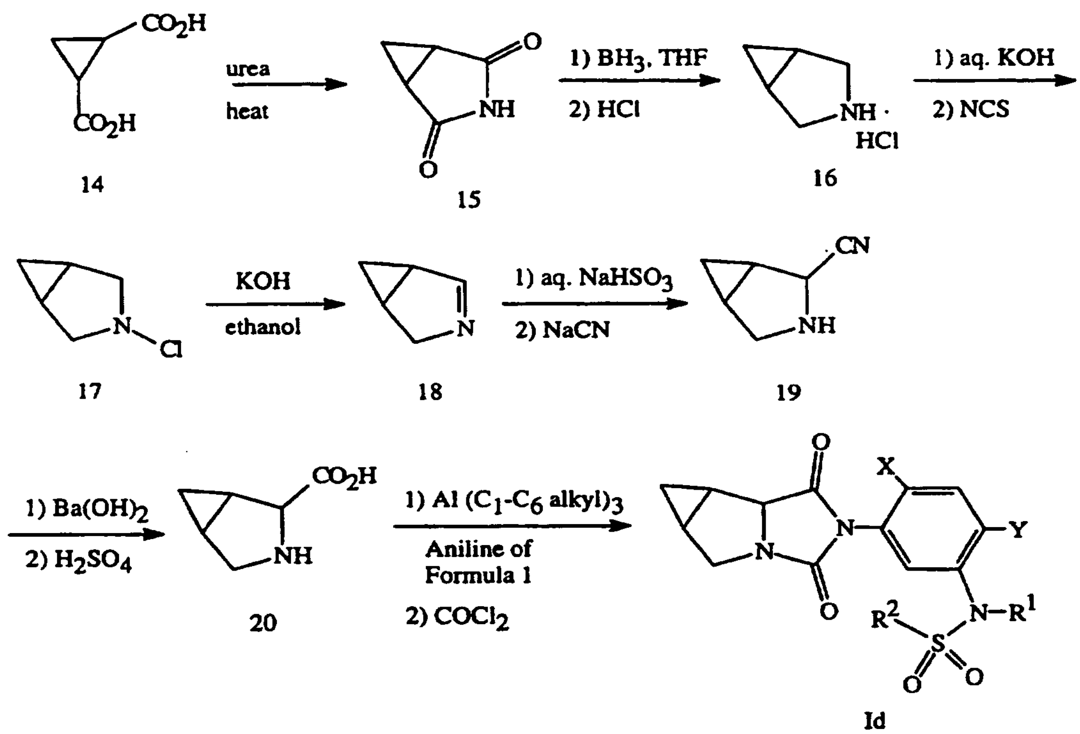


Compounds of Formula I wherein J = J-3, J-4, J-5, J-9, J-10 and J-19 are also prepared by first converting the aniline to the appropriate isocyanate, and then condensation with the appropriate J-group precursor. Methods for the preparation of the J-4 precursor and the condensation are described in WO 92/11244, EP 476,697, ZA 91/00466, JP 377,874, and U.S. 3,902,887. The synthesis of the J-5 precursor and the condensation with isocyanates is described in WO 92/13453 and EP 230,874. Methods for the preparation of the J-3 precursor and the condensation with isocyanates are described in EP 484,776. Methods for the preparation of the J-19 precursor and its condensation with isocyanates are described in EP 493,323. The synthesis of the J-10 precursor and the condensation with isocyanates is described in *J. Pesticide Sci.*, (1993), *18*, 309. In a similar vein, the imino compounds of Formula I wherein J = J-9 can be prepared from the corresponding isocyanates of the anilines. The condensation procedure and J-group precursor preparation for compounds containing J-9 are disclosed in EP 457,151, JP 4,145,087, EP 480,871 and DE 3,927,388.

One skilled in the art will recognize that when Q or Q^1 is S in the desired product, the appropriate isothiocyanate is used instead of the isocyanate in the synthesis.

For some compounds of Formula I wherein J = J-3, J-4, J-5, J-6, J-10, and J-19, the coupling can also be accomplished starting with the aniline rather than the isocyanate. For example, the synthesis of compounds of Formula Id (compounds of Formula I wherein R^9 and R^{10} are taken together to form a cyclopropane ring) is illustrated in Scheme 8.

Scheme 8



Treatment of cyclopropane dicarboxylic acid of Formula 14 with urea and heating to 175-185 °C affords the dicarboximide of Formula 15 as described by G. C. Crockett et al. in *Synth. Commun.* (1981), *11*, 447-454. The diester of the diacid of Formula 14 is prepared by the method described by L. L. McCoy in *J. Am. Chem. Soc.*, (1958), *80*, 65-68. The diacid can be obtained by saponification of the diester using well-known methods. Reduction of the dicarboximide of Formula 15 with borane in an inert solvent, such as tetrahydrofuran (THF), followed by work-up with aqueous hydrochloric acid affords the azabicyclo[3.1.0]hexane hydrochloride of Formula 16. The reduction is preferably conducted with heating, for example in THF at reflux, as described by H. C. Brown and P. Heim in *J. Org. Chem.*, (1973), *38*, 912-916.

The amine hydrochloride of Formula 16 is converted via a five step sequence to the α-aminoacid of Formula 20 as illustrated. Purification of the intermediates is not necessary. Neutralization of the amine hydrochloride with a base, such as concentrated aqueous potassium hydroxide, liberates the free amine. Dissolution of the amine in an

inert solvent, such as diethyl ether, and treatment with a solution of *N*-chlorosuccinimide (NCS) in an inert solvent such as ether, produces the chloramine of Formula 17. The solution of the chloramine is then treated with ethanolic potassium hydroxide to effect dehydrochlorination and give the imine of Formula 18. Once again, the imine is not purified but treated directly first with aqueous sodium bisulfite, and then with solid sodium cyanide to afford the aminonitrile of Formula 19. The reaction mixture is poured into water and extracted with a water-immiscible solvent such as ether. The organic layers are dried and evaporated under reduced pressure to afford the aminonitrile. No additional purification is necessary. The aminonitrile can be converted to the aminoacid of Formula 20 by hydrolysis with aqueous barium hydroxide followed by neutralization with sulfuric acid. A mixture of epimers at the carboxylic acid centers is obtained, and the individual diastereomers can be separated by chromatography.

The acid of Formula 20 is reacted with the aniline of Formula 1 and a trialkylaluminum reagent (e.g., trimethylaluminum), in a non-coordinating solvent such as an aromatic hydrocarbon (e.g., benzene and toluene) or halogenated hydrocarbon (e.g., methylene chloride, chloroform, and dichloroethane) to obtain the amide. Generally, the reaction requires 0.1 to 48 hours at a temperature of 0 °C to 25 °C to proceed to completion. The amides are isolated by extraction into an organic solvent, aqueous wash, and removal of the solvent under reduced pressure. Purification can be accomplished by chromatography or recrystallization. The condensation with the amine can also be performed starting with the ester of the acid of Formula 20.

The tricyclic imide of Formula Id can be prepared from the α-aminoamide by condensation with phosgene or a phosgene equivalent. Treatment of the α-aminoamide with phosgene is preferably carried out in the presence of a tertiary-amine base such as triethylamine, pyridine, or *N,N*-diisopropylethylamine, in an inert solvent such as dichloromethane or 1-chlorobutane. The phosgene can be added as a gas or as a solution in an inert solvent such as toluene. Suitable temperatures range from about 0 °C to the reflux temperature of the solvent. 1,1'-Carbonyldiimidazole, diphosgene ($ClC(=O)OCCl_3$) and triphosgene ($Cl_3COC(=O)OCCl_3$) can also be used in a similar manner.

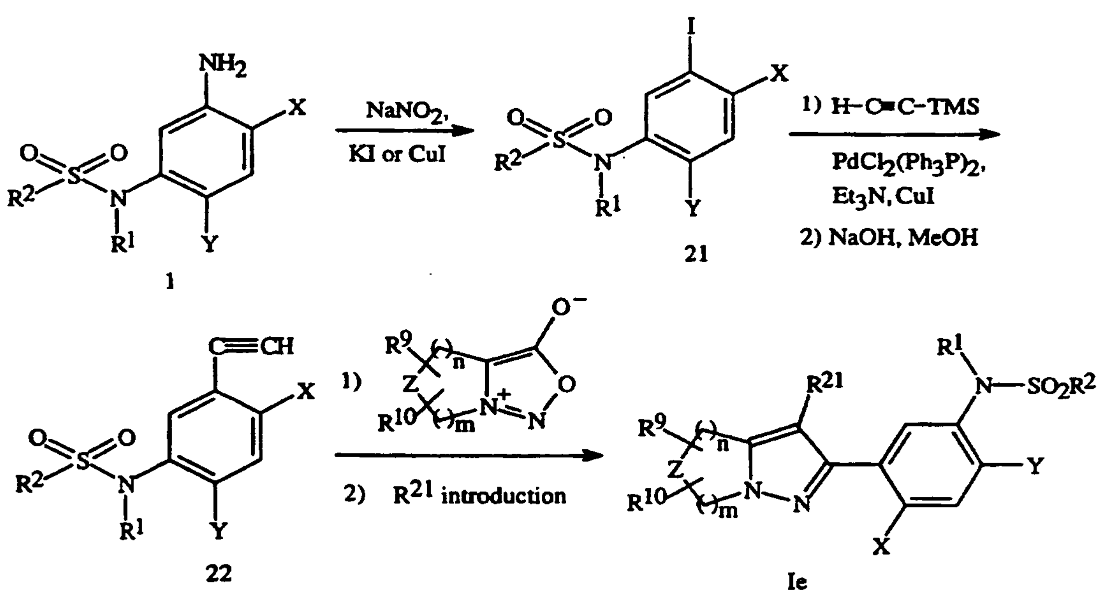
The tricyclic imide of Formula Id can be isolated by extraction into an organic solvent, aqueous wash, and removal of the solvent under reduced pressure. Additional purification can be accomplished by chromatography or recrystallization.

The preparation of compounds of Formula I wherein J = J-6 and Z is CR^9R^{10} is also described in WO94/05668.

Aryl Iodides

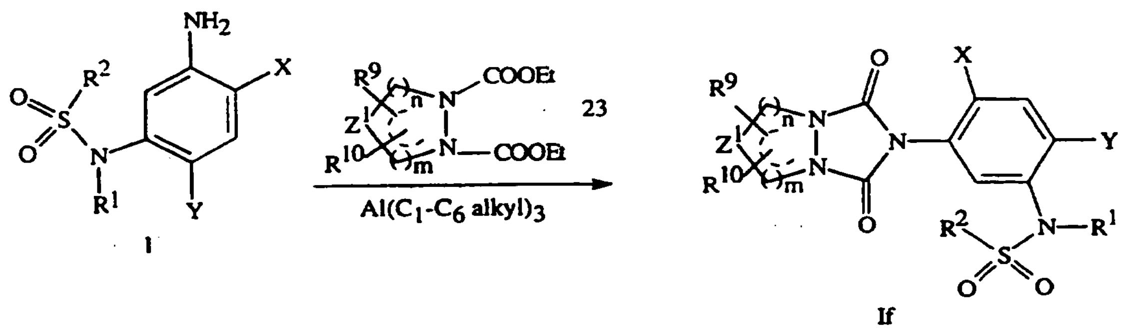
For the preparation of compounds of Formula I wherein J = J-11, the appropriate aniline is first converted to the aryl alkyne as illustrated in Scheme 9. The aniline of Formula 1 is converted to the aryl iodide of Formula 21 via diazotization followed by treatment with a metal iodide salt. The aryl iodide is linked by a palladium coupling reaction to give the trimethylsilyl (TMS) alkyne. Hydrolysis of the TMS group with base affords the terminal alkyne of Formula 22. In the case of J-11, a [3+2] cycloaddition using a sydnone as the dipole and the alkyne as the dipolarophile affords the bicyclic pyrazole compounds. Introduction of the R^{21} group affords the sulfonamides of Formula Ie. For example, treatment with *N*-chlorosuccinimide affords the R^{21} = Cl compound. These methods are described in WO 93/15074, JP 4,059,706, WO 92/06962, and JP 3,163,063.

Scheme 9



For compounds of Formula I wherein J = J-5, the coupling can also be accomplished starting with the aniline rather than the isocyanate. This method is described in WO 94/10173. For example, the synthesis of compounds of Formula If is illustrated in Scheme 10. Treatment of a diester of Formula 23 with an aniline of Formula 1 in the presence of a trialkylaluminum reagent (e.g., trimethylaluminum) in a non-coordinating solvent such as an aromatic hydrocarbon (e.g., benzene, toluene) or a halogenated hydrocarbon (e.g., methylene chloride, chloroform, and dichloroethane) affords a compound of Formula If.

Scheme 10



Methods for the preparation of compounds of Formula I wherein J = J-13 are described in EP 379,911, U.S. 4,123,252, and U.S. 4,042,373. Methods for the preparation of compounds of Formula I wherein J = J-14 are described in U.S. 4,818,272. Methods for the preparation of compounds of Formula I wherein J = J-17 are described in WO 95/25725 and DE 4,437,295. Methods for the preparation of compounds of Formula I wherein J = J-18 are described in DE 3,340,296 and U.S. 93/06132. Compounds of Formula I wherein J = 15 and J = 16 can be prepared by methods known in the art or by obvious modifications of these methods.

It is recognized that some reagents and reaction conditions described above for preparing compounds of Formula I may not be compatible with certain functionalities present in the intermediates. In these instances, the incorporation of protection/deprotection sequences or functional group interconversions into the synthesis will aid in obtaining the desired products. The use and choice of the protecting groups will be apparent to one skilled in chemical synthesis (see, for example, Greene, T. W.; Wuts, P. G. M. *Protective Groups in Organic Synthesis*, 2nd ed.; Wiley: New York, 1991). One skilled in the art will recognize that, in some cases, after the introduction of a given reagent as it is depicted in any individual scheme, it may be necessary to perform additional routine synthetic steps not described in detail to complete the synthesis of compounds of Formula I.

One skilled in the art will also recognize that compounds of Formula I and the intermediates described herein can be subjected to various electrophilic, nucleophilic, radical, organometallic, oxidation, and reduction reactions to add substituents or modify existing substituents.

Without further elaboration, it is believed that one skilled in the art using the preceding description can utilize the present invention to its fullest extent. The following Examples are, therefore, to be construed as merely illustrative, and not limiting of the disclosure in any way whatsoever. Percentages are by weight except for chromatographic solvent mixtures or where otherwise indicated. Parts and percentages

for chromatographic solvent mixtures are by volume unless otherwise indicated. ^{1}H NMR data are in ppm downfield from tetramethylsilane. Couplings are designated by (s)-singlet, (d)-doublet, (t)-triplet, (q)-quartet, (m)-multiplet, (dd)-doublet of doublets, (ddd)-doublet of doublet of doublets, (dt)-doublet of triplets, and (br s)-broad singlet.

EXAMPLE 1

Step A: Preparation of *N*-(4-chloro-2-fluoro-5-nitrophenyl)acetamide

To a stirred solution of *N*-(4-chloro-2-fluorophenyl)acetamide (180.6 g, 0.96 mol) in concentrated sulfuric acid (1L) was added a mixture of 175 mL of concentrated HNO_3 and 175 mL of concentrated sulfuric acid at 0 to 5 °C in 1.5 h. After the addition was finished, the reaction mixture was stirred for another 0.5 h. The solution was poured into 5 L of ice water. After the product precipitated, it was isolated by filtration and then was dissolved in 2.5 L of ethyl acetate. After separation of the water layer, the organic layer was dried over sodium sulfate and then the solvent was evaporated. The crude product was triturated in diisopropyl ether (1.5 L), isolated by filtration, and dried under reduced pressure to afford the title compound of Step A (196.2 g, 87.6%) melting at 145-146 °C. ^{1}H NMR (Me_2SO-d_6) δ 10.3-10.2 (s, 1H), 8.9 (d, 1H), 7.9-7.8 (d, 1H), 2.2-2.1 (s, 3H).

Step B: Preparation of *N*-(5-amino-4-chloro-2-fluorophenyl)acetamide

To a solution of the title compound of Step A (15 g, 65 mmol) in 500 mL ethyl acetate was added 1.5 g Raney-Nickel that previously has been washed with methanol and ethyl acetate. The hydrogenation was performed at 5 bar of hydrogen pressure in an autoclave for 24 h at 50 °C. After filtration of the reaction through Celite®, the solvent was removed under reduced pressure. The crude product was triturated with petroleum ether and dried to isolate the title compound of Step B (12.6 g, 96%) melting at 142-143 °C. ^{1}H NMR ($CDCl_3$) δ 7.9 (d, 1H), 7.3-7.2 (br s, 1H), 7.1-7.0 (d, 1H), 4.1-4.0 (s, 2H), 2.2-2.1 (s, 3H).

Step C: Preparation of *N*-[4-chloro-5-[[(chloromethyl)sulfonyl]amino]-2-fluorophenyl]acetamide

To a stirred solution of the title compound of Step B (8.10 g, 40 mmol) in pyridine (50 mL) was added chloromethylsulfonyl chloride (3.84 mL, 40.45 mmol) over 30 minutes at 0 °C. After stirring at room temperature for 14 h, chloromethylsulfonyl chloride (0.38 mL, 4.05 mmol) was added to complete the reaction. Water was added so that the product precipitated. After filtration and washing with water and petroleum ether, the title compound of Step C was isolated as a bright powder (11.17 g, 89%) melting at 208-210 °C. ^{1}H NMR (Me_2SO-d_6) δ 10.2-10.1 (s, 1H), 9.9 (s, 1H), 8.1 (d, 1H), 7.6-7.5 (d, 1H), 5.0-4.9 (s, 2H), 2.1 (s, 3H).

Step D: Preparation of *N*-(5-amino-2-chloro-4-fluorophenyl)-1-chloromethanesulfonamide

The title compound of Step C (10.3g, 32.6 mmol) was suspended in 450 mL of 2*M* HCl. The temperature was raised to the boiling point of the reaction mixture under an argon atmosphere. After 45 minutes of stirring at this temperature, the reaction was cooled to room temperature, neutralized with $NaHCO_3$, and the product was extracted into ethyl acetate. After drying of the solution over sodium sulfate, the solvent was evaporated under reduced pressure yielding 8.9 g (98%) of the title compound of Step D as bright crystals melting at 105-107 °C. ^1H NMR (Me_2SO-d_6) δ 9.9-9.8 (br s, 1H), 7.2 (d, 1H), 6.9 (d, 1H), 5.5-5.4 (s, 2H), 4.9 (s, 2H).

Step E: Preparation of 1-chloro-*N*-(2-chloro-4-fluoro-5-isocyanatophenyl)methanesulfonamide

To a stirred solution of phosgene (68 mmol) in 35 mL toluene was added the title compound of Step D (4.2 g, 15.4 mmol) in 80 mL toluene at 0 °C and the reaction was stirred at room temperature overnight. The temperature was then raised to 70 °C for 4 h. After cooling to room temperature, the reaction mixture was filtrated and the solvent was removed under reduced pressure. Drying of the white precipitate under reduced pressure yielded the title compound of Step E (4.4 g, 95%) melting at 101.5-102.5 °C. ^1H NMR ($CDCl_3$) δ 7.5 (d, 1H), 7.3 (d, 1H), 7.0-6.9 (br s, 1H), 4.6-4.5 (s, 2H).

Step F: Preparation of (2*R*-*cis*)-1-[[[4-chloro-5-[[(chloromethyl)sulfonyl]amino]-2-fluorophenyl]amino]carbonyl]-4-hydroxy-2-pyrrolidinecarboxylic acid

To a stirred slurry of the title compound of Step E (34 mmol) in 550 mL toluene was added 4-*cis*-*D*-hydroxyproline (4.55 g, 35 mmol) at room temperature. 500 mL of dimethoxyethane was added and the temperature was raised to 70 °C. After 1 h the temperature was raised to 90 °C for 6 h, and then the reaction mixture was stirred at room temperature overnight. The solvent was removed under reduced pressure and after the addition of water, petroleum ether and ethyl acetate, the product was extracted into the water phase. The product was precipitated by removal of the water under reduced pressure, dissolved in ethyl acetate, and dried over Na_2SO_4. The solvent was removed under reduced pressure furnishing the title compound of Step F (8.06 g, 50%). ^1H NMR (Me_2SO-d_6) δ 12.4 (br s, 1H), 10.1 (br s, 1H), 8.2 (s, 1H), 7.7 (d, 1H), 7.5 (d, 1H), 5.1-5.0 (br s, 1H), 5.0-4.9 (s, 2H), 4.4 (m, 1H), 4.3 (m, 1H), 3.7-3.6 (m, 1H), 3.4-3.3 (m, 2H), 2.4-2.3 (m, 1H).

Step G: Preparation of (6*R*-*trans*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(tetrahydro-6-hydroxy-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide

To a stirred solution of the title compound of Step F (2.7 g, 5.4 mmol) and *N*-hydroxysuccinimide (0.621 g, 5.4 mmol) in acetonitrile (50 mL) was added a solution

of *N,N*-dicyclohexylcarbodiimide (1.14 g, 5.4 mmol) in acetonitrile (30 mL) over 30 minutes at 0 to -5 °C. The reaction was stirred at room temperature for 14 h. The by-products were removed by filtration and the solvent was evaporated under reduced pressure to yield the title compound of Step G (2.6 g, quantitative yield) as a crude product melting at 198-200 °C. ^{1}H NMR (Me_2SO-d_6) δ 10.2 (br s, 1H), 7.8-7.7 (d, 1H), 7.5-7.4 (d, 1H), 5.2-5.1 (br s, 1H), 5.1-5.0 (s, 2H), 4.5 (m, 1H), 4.3-4.2 (m, 1H), 3.7 (m, 1H), 3.1 (m, 1H), 2.3 (m, 1H), 2.0 (m, 1H).

<u>Step H:</u> <u>Preparation of (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide</u>

To a stirred solution of the title compound of Step G (2.7 g, 5.4 mmol) in dichloromethane (60 mL) was added pyridine (1.0 mL) at -55 °C and DAST (diethylaminosulfur trifluoride) (0.8 mL, 5.8 mmol) over 30 minutes at the same temperature. The reaction mixture was warmed to room temperature and the clear solution was stirred for 14 h. After concentration under reduced pressure, the resulting brown oil was dissolved in ethyl acetate and this solution was treated with water and dilute HCl. The organic layer was separated, dried with sodium sulfate, and the solvent was evaporated under reduced pressure to yield a crude product containing the title product of Step H (1.81 g, 61%). ^{1}H NMR ($CDCl_3$) δ 7.62 (d, 1H), 7.34 (d, 1H), 7.26 (br s, 1H), 5.5 (m, 1H), 4.60 (dd, 1H), 4.52 (s, 2H), 4.12 (m, 1H), 3.62 (dd, 1H), 2.64 (m, 1H), 2.06 (m, 1H).

<u>EXAMPLE 2</u>

<u>Step A:</u> <u>Preparation of (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide</u>

To a stirred suspension of the title compound of Example 1, Step G (3.3 g, 8 mmol) in 25 mL toluene and 0.02 g DMF was added at 80 °C thionyl chloride (1.31 g, 11 mmol) over a period of 15 minutes. The suspension was stirred at the same temperature for 2 h and at 105 °C for 30 minutes. After cooling to room temperature, the organic layer was washed with water, dried, and the solvent was evaporated under reduced pressure to yield the title compound of Step A, a compound of this invention, in quantitative yield as a crude powdery product melting at 169-170 °C. ^{1}H NMR ($CDCl_3$) δ 7.64 (d, 1H), 7.36 (d, 1H), 7.20 (br s, 1H), 4.78 (m, 2H), 4.56 (s, 2H), 4.24 (dd, 1H), 3.62 (dd, 1H), 2.62 (m, 1H), 2.38 (m, 1H).

EXAMPLE 3

Step A: Preparation of (6*S*-*cis*)-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]-*N*-[(chloromethyl)sulfonyl]acetamide

To a solution of the title compound of Example 1, Step H (4.14 g, 10 mmol) in anhydrous dichloromethane (200 mL) and pyridine (5 mL) was added a solution of acetyl chloride (0.863 g, 11 mmol) in dichloromethane (10 mL) dropwise at room temperature. After completion of the reaction (monitored by tlc), the organic phase was washed with water (50 mL) and diluted with HCl (5%, 50 mL). The organic layer was separated, dried ($MgSO_4$), and the solvent was removed in vacuo to give the title compound of Step A, a compound of this invention, as a white solid (4.3 g, 94%) melting at 198-200 °C. ^1H NMR ($CDCl_3$) δ 7.56 (m, 2H), 5.52 (m, 1H), 5.40 (dd, 1H), 4.84 (d, 1H), 4.62 (dd, 1H), 4.08 (m, 1H), 3.62 (m, 1H), 2.68 (m, 1H), 2.05 (s, 3H), 1.98 (m, 1H).

EXAMPLE 4

Step A: Preparation of (6*S*-*cis*)-*N*-[2-chloro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]-*N*-[(chloromethyl)sulfonyl]acetamide

To a solution of the title compound of Example 2, Step A (4.29 g, 10 mmol) in anhydrous dichloromethane (200 mL) and pyridine (5 mL) was added a solution of acetyl chloride (0.862 g, 11 mmol) in dichloromethane (10 mL) dropwise at room temperature. After completion of the reaction (monitored by tlc), the organic phase was washed with water (50 mL) and diluted with HCl (5%, 50 mL) and water (50 mL). The organic layer was separated, dried (MgSO4), and the removed the solvent to give the title compound of Step A, a compound of this invention, as a white solid (4.4 g, 93%) melting at 180-181 °C. ^1H NMR ($CDCl_3$) δ 7.50 (m, 2H), 5.38 (dd, 1H), 4.92 (d, 1H), 4.78 (m, 2H), 4.24 (dd, 1H), 3.62 (dd, 1H), 2.62 (m, 1H), 2.26 (m, 1H), 2.04 (s, 3H).

EXAMPLE 5

Step A: Preparation of (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]-*N*-methylmethanesulfonamide

A mixture of the title compound of Example 1, Step H (0.414 g, 1 mmol), dimethyl sulfate (0.14 g, 1.1 mmol), and potassium carbonate (0.27 g) in acetone (10 mL) was stirred at room temperature for 4 h. After completion of the reaction, the potassium carbonate was filtered off and the solvent was removed on a rotary evaporator. The title compound of Step A, a compound of this invention, was isolated by flash chromatography (0.41 g, 95%) as a white solid melting at 90-92 °C. ^1H NMR

($CDCl_3$) δ 7.52 (d, 1H), 7.39 (d, 1H), 5.54 (m, 1H), 4.62 (s, 2H), 4.60 (m, 1H), 4.08 (m, 1H), 3.60 (dd, 1H), 3.42 (s, 3H), 2.64 (m, 1H), 2.01 (m, 1H).

EXAMPLE 6

Step A: Preparation of (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]-*N*-ethylmethanesulfonamide

A mixture of the title compound of Example 1, Step H (0.414 g, 1 mmol), diethyl sulfate (0.17 g, 1.1 mmol), and potassium carbonate (0.27 g) in acetone (10 mL) was stirred at room temperature for 4 h. After completion of the reaction, the potassium carbonate was filtered off and the solvent was removed on a rotary evaporator. The title compound of Step A, a compound of this invention, was isolated by flash chromatography (0.41 g, 92%) as a white solid melting at 198-200 °C. ^{1}H NMR ($CDCl_3$) δ 7.46 (d, 1H), 7.42 (d, 1H), 5.52 (m, 1H), 4.62 (dd, 1H), 4.59 (s, 2H), 4.02 (dd, 1H), 3.80 (m, 4H), 3.60 (dd, 1H), 2.64 (m, 1H), 2.01 (m, 1H), 1.20 (t, 6H).

EXAMPLE 7

Step A: Preparation of (6*S*-*cis*)-methyl [2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl][(chloromethyl)sulfonyl]carbamate

To a mixture of the title compound of Example 1, Step H (0.32 g, 0.7 mmol) and pyridine (0.5 mL) in dichloromethane (5 mL) was added a solution of methyl chloroformate (0.09 g, 0.95 mmol) in dichloromethane (1 mL) at room temperature. After completion of the reaction (2 h), the solvents were removed in vacuo and the title compound of Step A, a compound of this invention, was isolated by flash chromatography (0.31 g, 95%) as a white solid melting at 108-115 °C. ^{1}H NMR ($CDCl_3$) δ 7.40 (m, 2H), 5.42 (m, 1H), 5.36 (dd, 1H), 4.92 (dd, 1H), 4.60 (m, 1H), 4.04 (m, 1H), 3.82 (s, 3H), 3.60 (dd, 1H), 2.64 (m, 1H), 2.02 (m, 1H).

EXAMPLE 8

Step A: Preparation of (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]-*N*-methylmethanesulfonamide

A mixture of the title compound of Example 2, Step A (0.43 g, 1 mmol), dimethyl sulfate (0.17 g, 1.1 mmol), and potassium carbonate (0.27 g) in acetone (10 mL) was stirred at room temperature for 4 h. After completion of the reaction, potassium carbonate was filtered off and the solvent was removed on a rotary evaporator to yield the title compound of Step A, a compound of this invention, as a white solid purified by flash chromatography (0.40 g, 90%) and melting at 119-124 °C. ^{1}H NMR ($CDCl_3$) δ 7.52 (d, 1H), 7.42 (d, 1H), 4.76 (m, 2H), 4.62 (s, 2H), 4.24 (dd, 1H), 3.64 (dd, 1H), 3.42 (s, 3H), 2.62 (m, 1H), 2.22 (m, 1H).

EXAMPLE 9

Step A: Preparation of (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]-*N*-ethylmethanesulfonamide

A mixture of the title compound of Example 2, Step A (0.43 g, 1 mmol), diethyl sulfate (0.17 g, 1.1 mmol), and potassium carbonate (0.27 g) in acetone (10 mL) was stirred at room temperature for 4 h. After completion of the reaction, potassium carbonate was filtered off and the solvent was removed on a rotary evaporator to yield the title compound of Step A, a compound of this invention, as a white solid purified by flash chromatography (0.4 g, 89%) and melting at 152-154 °C. ^{1}H NMR ($CDCl_3$) δ 7.40 (m, 2H), 5.30 (s, 2H), 4.72 (m, 2H), 4.22 (dd, 1H), 3.82 (m, 4H), 3.60 (dd, 1H), 2.60 (m, 1H), 2.24 (m, 1H), 1.40 (t, 3H), 1.20 (t, 3H).

EXAMPLE 10

Step A: Preparation of (6*S*-*cis*)-methyl [2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl][(chloromethyl)sulfonyl]carbamate

To a mixture of the title compound of Example 2, Step A (0.34 g, 0.79 mmol) and pyridine (0.5 mL) in dichloromethane (5 mL) was added a solution of methyl chloroformate (85 mg, 0.9 mmol) in dichloromethane (1 mL) at room temperature. After completion of the reaction (2 h), the solvents were removed and the title compound of Step A, a compound of this invention, was isolated by flash chromatography (0.34 g, 93%) as a white solid melting at 117-124 °C. ^{1}H NMR ($CDCl_3$) δ 7.40 (m, 2H), 5.40 (dd, 1H), 4.96 (dd, 1H), 4.76 (m, 2H), 4.24 (dd, 1H), 3.84 (s, 3H), 3.62 (dd, 1H), 2.60 (m, 1H), 2.24 (m, 1H).

EXAMPLE 11

Step A: Preparation of 1-chloro-*N*-[2-chloro-4-fluoro-5-(hexahydro-7-hydroxy-1,3-dioxoimidazo[1,5-*a*]pyridin-2(3*H*)-yl)phenyl]methanesulfonamide

To a solution of the title compound of Example 1, Step E (4.54 g, 15.2 mmol) in dichloromethane (20 mL) was added dropwise a solution of methyl *cis*-4-hydroxy-2-piperidinecarboxylate (2.41 g, 15.2 mmol, prepared as described in *J. Org. Chem.* (1991), 4084) in dichloromethane (20 mL) at room temperature. The reaction was stirred at room temperature for 20 hours, quenched by the addition of water, and the aqueous layer was extracted with dichloromethane. The combined organic layers were washed with water and dried over magnesium sulfate. The solvent was removed under reduced pressure and the title compound of Step A, a compound of this invention, was isolated as a foam by flash chromatography (4.98 g). ^{1}H NMR (Me_2SO-d_6) δ 10.1 (br s, 1H), 7.75 (m, 1H), 7.4 (dd, 1H), 5.1 (m, 1H), 4.9 (s, 2H), 4.1-3.9 (m, 3H), 3.75 (m, 1H), 2.95 (m, 1H), 2.05 (m, 1H), 1.9 (br d, 1H), 1.2 (m, 1H).

EXAMPLE 12

Step A: Preparation of *cis*-1-chloro-*N*-[2-chloro-4-fluoro-5-(7-fluorohexahydro-1,3-dioxoimidazo[1,5-*a*]pyridin-2(3*H*)-yl)phenyl]methanesulfonamide

To a solution of the title compound of Example 11, Step A (771 mg, 1.80 mmol) in dichloromethane (10 mL) was added dropwise diethylaminosulfur trifluoride (0.48 mL, 3.60 mmol) at 0 °C. The reaction was stirred at 0 °C for 1 hour, quenched with cold water, and extracted with dichloromethane. The combined organic layers were washed with water, dried over magnesium sulfate, and concentrated under reduced pressure. The title compound of Step A, a compound of this invention, was isolated by flash chromatography (332 mg) as a foam melting at 60-64 °C. ^{1}H NMR ($CDCl_3$) δ 7.7 (d, 1H), 7.4 (d, 1H), 7.1 (br s, 1H), 5.28 and 5.12 (two br s, 1H), 4.6 (s, 2H), 4.4 (dd, 1H), 4.2 (dd, 1H), 3.3 (ddd, 1H), 2.65 (m, 1H), 2.2 (m, 1H), 1.9-1.6 (m, 2H).

EXAMPLE 13

Step A: Preparation of ethyl [(dimethylamino)[[[(4-chloro-2-fluoro-5-nitrophenyl)amino]carbonyl]imino]methyl]methylcarbamate

To a solution of 1-chloro-5-fluoro-4-isocyanato-2-nitrobenzene (3.4 g, 15.7 mmol) in toluene (50 mL) was added dropwise a solution of ethyl [(dimethylamino)iminomethyl]methylcarbamate (2.41 g, 15.2 mmol, prepared as described in U.S. 3,902,887) in toluene (50 mL) at room temperature. The reaction was stirred at room temperature for 2 hours, quenched by the addition of water, and the aqueous layer was extracted with dichloromethane. The excess solvent was removed under reduced pressure and the title compound of Step A was isolated by flash chromatography as a yellow solid (5.07 g) melting at 158-159 °C. ^{1}H NMR ($CDCl_3$) δ 9.05 (d, 1H), 7.3 (br s, 1H), 7.2 (d, 1H), 4.2 (q, 2H), 3.15 (s, 3H), 3.0 (s, 6H), 1.2 (br s, 3H).

Step B: Preparation of 3-(4-chloro-2-fluoro-5-nitrophenyl)-6-(dimethylamino)-5-methyl-1,3,5-triazine-2,4(1*H*,3*H*)-dione

A mixture of the title compound of Step A (3.0 g, 7.7 mmol) in methanol (150 mL) was stirred at room temperature overnight. The excess solvent was removed under reduced pressure to provide the title compound of Step B as a white solid (2.8 g). ^{1}H NMR ($CDCl_3$) δ 8.05 (d, 1H), 7.4 (d, 1H), 3.45 (s, 3H), 3.1 (s, 6H).

Step C: Preparation of 3-(5-amino-4-chloro-2-fluorophenyl)-6-(dimethylamino)-5-methyl-1,3,5-triazine-2,4(1*H*,3*H*)-dione

To a slurry of iron powder (5.3 g) in 5% aqueous acetic acid (30 mL) was added dropwise a solution of the title compound of step B (2.8 g, 8.1 mmol) in a mixture of concentrated acetic acid (25 mL) and ethyl acetate (25 mL) at room temperature. The reaction was stirred at room temperature for 30 minutes, diluted with excess ethyl acetate, filtered through Celite®, and washed with water. The aqueous phase was

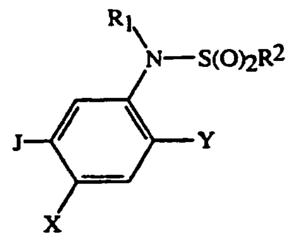
extracted with ethyl acetate and the combined organic layers were washed with saturated aqueous sodium bicarbonate solution and water. The organic layers were then dried over magnesium sulfate and concentrated under reduced pressure. The title compound of Step C was isolated by flash chromatography as a foam (1.59 g). ^{1}H NMR ($CDCl_3$) δ 7.15 (d, 1H), 6.65 (d, 1H), 3.95 (br s, 2H), 3.4 (s, 3H), 3.1 (s, 6H).

Step D: Preparation of 1-chloro-*N*-[2-chloro-5-[4-(dimethylamino)-3,6-dihydro-3-methyl-2,6-dioxo-1,3,5-triazin-1(2*H*)-yl]-4-fluorophenyl]methanesulfonamide

To a solution of the title compound of Step C (359 mg, 1.15 mmol), pyridine (0.50 mL), and a catalytic amount of 4-dimethylamino pyridine in dichloromethane was added chloromethylsulfonyl chloride (0.136 mL, 1.37 mmol) at 0 °C. The reaction was stirred at 0 °C for 90 minutes and then concentrated under reduced pressure. The crude oil was dissolved in dichloromethane and washed sequentially with water, 1*N* aqueous HCl, and water. The organic phase was then dried over magnesium sulfate and concentrated under reduced pressure. The title compound of Step D, a compound of this invention, was isolated by flash chromatography as a foam (126 mg) melting at 234-237 °C. ^{1}H NMR ($CDCl_3$) δ 7.7 (d, 1H), 7.35 (d, 1H), 7.0 (br s, 1H), 4.55 (q, 2H), 3.45 (s, 3H), 3.15 (s, 6H).

By the procedures described herein together with methods known in the art, the following compounds of Table 1 can be prepared. The following abbreviations are used in the Table which follows: CN = cyano and Ph = phenyl.

TABLE 1



J = 1, Y = Cl, and $R^2 = CH_2Cl$

X	R^1	Z	n	m
F	H	CH_2	1	1
F	$C(=O)CH_3$	CH_2	1	1
F	CO_2CH_3	CH_2	1	1
F	H	CHF	1	1
F	$C(=O)CH_3$	CHF	1	1
F	CO_2CH_3	CHF	1	1
F	H	CH_2	1	2
F	$C(=O)CH_3$	CH_2	1	2
F	CO_2CH_3	CH_2	1	2
F	H	CHF	1	2
F	$C(=O)CH_3$	CHF	1	2
F	CO_2CH_3	CHF	1	2
Cl	H	CH_2	1	1
Cl	$C(=O)CH_3$	CH_2	1	1
Cl	CO_2CH_3	CH_2	1	1
Cl	H	CHF	1	1
Cl	$C(=O)CH_3$	CHF	1	1
Cl	CO_2CH_3	CHF	1	1
Cl	H	CH_2	1	2
Cl	$C(=O)CH_3$	CH_2	1	2
Cl	CO_2CH_3	CH_2	1	2
Cl	H	CHF	1	2
Cl	$C(=O)CH_3$	CHF	1	2
Cl	CO_2CH_3	CHF	1	2

J = 2, Y = Cl, and $R^2 = CH_2Cl$

X	R^1	Z	n	m
F	H	CH_2	1	1
F	$C(=O)CH_3$	CH_2	1	1
F	CO_2CH_3	CH_2	1	1
F	H	CHF	1	1
F	$C(=O)CH_3$	CHF	1	1
F	CO_2CH_3	CHF	1	1
F	H	CH_2	1	2
F	$C(=O)CH_3$	CH_2	1	2
F	CO_2CH_3	CH_2	1	2
F	H	CHF	1	2
F	$C(=O)CH_3$	CHF	1	2
F	CO_2CH_3	CHF	1	2
Cl	H	CH_2	1	1
Cl	$C(=O)CH_3$	CH_2	1	1
Cl	CO_2CH_3	CH_2	1	1
Cl	H	CHF	1	1
Cl	$C(=O)CH_3$	CHF	1	1
Cl	CO_2CH_3	CHF	1	1
Cl	H	CH_2	1	2
Cl	$C(=O)CH_3$	CH_2	1	2
Cl	CO_2CH_3	CH_2	1	2
Cl	H	CHF	1	2
Cl	$C(=O)CH_3$	CHF	1	2
Cl	CO_2CH_3	CHF	1	2

J = 3, Q = O, Y = Cl, and $R^2 = CH_2Cl$

X	R^1	R^{11}	R^{12}
F	H	CH_3	CH_2Cl
F	$C(=O)CH_3$	CH_3	CH_2Cl
F	CO_2CH_3	CH_3	CH_2Cl
F	H	$CH_2CH_2CH_2F$	CH_2Cl
F	$C(=O)CH_3$	$CH_2CH_2CH_2F$	CH_2Cl
F	CO_2CH_3	$CH_2CH_2CH_2F$	CH_2Cl
F	H	CH_3	CH_2F
F	$C(=O)CH_3$	CH_3	CH_2F

F	CO_2CH_3	CH_3	CH_2F
F	H	$CH_2CH_2CH_2F$	CH_2F
F	$C(=O)CH_3$	$CH_2CH_2CH_2F$	CH_2F
F	CO_2CH_3	$CH_2CH_2CH_2F$	CH_2F
Cl	H	CH_3	CH_2Cl
Cl	$C(=O)CH_3$	CH_3	CH_2Cl
Cl	CO_2CH_3	CH_3	CH_2Cl
Cl	H	$CH_2CH_2CH_2F$	CH_2Cl
Cl	$C(=O)CH_3$	$CH_2CH_2CH_2F$	CH_2Cl
Cl	CO_2CH_3	$CH_2CH_2CH_2F$	CH_2Cl
Cl	H	CH_3	CH_2F
Cl	$C(=O)CH_3$	CH_3	CH_2F
Cl	CO_2CH_3	CH_3	CH_2F
Cl	H	$CH_2CH_2CH_2F$	CH_2F
Cl	$C(=O)CH_3$	$CH_2CH_2CH_2F$	CH_2F
Cl	CO_2CH_3	$CH_2CH_2CH_2F$	CH_2F

J = 4, Q = O, Y = Cl, and $R^2 = CH_2Cl$

X	R^1	R^{13}	R^{14}
F	H	CH_3	CF_3
F	$C(=O)CH_3$	CH_3	CF_3
F	CO_2CH_3	CH_3	CF_3
F	H	CHF_2	CF_3
F	$C(=O)CH_3$	CHF_2	CF_3
F	CO_2CH_3	CHF_2	CF_3
F	H	CH_3	$N(CH_3)_2$
F	$C(=O)CH_3$	CH_3	$N(CH_3)_2$
F	CO_2CH_3	CH_3	$N(CH_3)_2$
F	H	CHF_2	$N(CH_3)_2$
F	$C(=O)CH_3$	CHF_2	$N(CH_3)_2$
F	CO_2CH_3	CHF_2	$N(CH_3)_2$
Cl	H	CH_3	CF_3
Cl	$C(=O)CH_3$	CH_3	CF_3
Cl	CO_2CH_3	CH_3	CF_3
Cl	H	CHF_2	CF_3
Cl	$C(=O)CH_3$	CHF_2	CF_3
Cl	CO_2CH_3	CHF_2	CF_3

Cl	H	CH_3	$N(CH_3)_2$
Cl	$C(=O)CH_3$	CH_3	$N(CH_3)_2$
Cl	CO_2CH_3	CH_3	$N(CH_3)_2$
Cl	H	CHF_2	$N(CH_3)_2$
Cl	$C(=O)CH_3$	CHF_2	$N(CH_3)_2$
Cl	CO_2CH_3	CHF_2	$N(CH_3)_2$

J = 5 and Q = O

X	Y	Z^1	n	m	R^1	R^2
F	H	CH_2	1	1	H	CH_2Cl
F	H	CH_2	1	1	H	CH_2Br
F	H	CH_2	1	2	H	CH_2Cl
F	H	CH_2	1	2	H	CH_2Br
F	H	CHF	1	1	H	CH_2Cl
F	H	CHF	1	1	H	CH_2Br
F	H	CHF	1	2	H	CH_2Cl
F	H	CHF	1	2	H	CH_2Br
F	H	CHCl	1	1	H	CH_2Cl
F	H	CHCl	1	1	H	CH_2Br
F	H	CHCl	1	2	H	CH_2Cl
F	H	CHCl	1	2	H	CH_2Br
F	Cl	CH_2	1	1	H	CH_2Cl
F	Cl	CH_2	1	1	H	CH_2Br
F	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl
F	Cl	CH_2	1	1	CO_2CH_3	CH_2Br
F	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CH_2	1	2	H	CH_2Cl
F	Cl	CH_2	1	2	H	CH_2Br
F	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Br
F	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br

F	Cl	CHF	1	1	H	CH_2Cl
F	Cl	CHF	1	1	H	CH_2Br
F	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	1	CO_2CH_3	CH_2Br
F	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHF	1	2	H	CH_2Cl
F	Cl	CHF	1	2	H	CH_2Br
F	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	2	CO_2CH_3	CH_2Br
F	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHCl	1	1	H	CH_2Cl
F	Cl	CHCl	1	1	H	CH_2Br
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHCl	1	2	H	CH_2Cl
F	Cl	CHCl	1	2	H	CH_2Br
F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	1	H	CH_2Cl
F	Br	CH_2	1	1	H	CH_2Br
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	1	CO_2CH_3	CH_2Br

F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	2	H	CH_2Cl
F	Br	CH_2	1	2	H	CH_2Br
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	2	CO_2CH_3	CH_2Br
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHF	1	1	H	CH_2Cl
F	Br	CHF	1	1	H	CH_2Br
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CHF	1	1	CO_2CH_3	CH_2Cl
F	Br	CHF	1	1	CO_2CH_3	CH_2Br
F	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHF	1	2	H	CH_2Cl
F	Br	CHF	1	2	H	CH_2Br
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CHF	1	2	CO_2CH_3	CH_2Cl
F	Br	CHF	1	2	CO_2CH_3	CH_2Br
F	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHCl	1	1	H	CH_2Cl
F	Br	CHCl	1	1	H	CH_2Br
F	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	1	CO_2CH_3	CH_2Br
F	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHCl	1	2	H	CH_2Cl
F	Br	CHCl	1	2	H	CH_2Br
F	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Br

F	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	2	CO_2CH_3	CH_2Br
F	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CH_2	1	1	H	CH_2Cl
F	CN	CH_2	1	1	H	CH_2Br
F	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	1	CO_2CH_3	CH_2Br
F	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CH_2	1	2	H	CH_2Cl
F	CN	CH_2	1	2	H	CH_2Br
F	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	2	CO_2CH_3	CH_2Br
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHF	1	1	H	CH_2Cl
F	CN	CHF	1	1	H	CH_2Br
F	CN	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CHF	1	1	CO_2CH_3	CH_2Cl
F	CN	CHF	1	1	CO_2CH_3	CH_2Br
F	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHF	1	2	H	CH_2Cl
F	CN	CHF	1	2	H	CH_2Br
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CHF	1	2	CO_2CH_3	CH_2Cl
F	CN	CHF	1	2	CO_2CH_3	CH_2Br
F	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHCl	1	1	H	CH_2Cl
F	CN	CHCl	1	1	H	CH_2Br

F	CN	CHCl	1	1	C(=O)CH_3	CH_2Cl
F	CN	CHCl	1	1	C(=O)CH_3	CH_2Br
F	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	1	CO_2CH_3	CH_2Br
F	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHCl	1	2	H	CH_2Cl
F	CN	CHCl	1	2	H	CH_2Br
F	CN	CHCl	1	2	C(=O)CH_3	CH_2Cl
F	CN	CHCl	1	2	C(=O)CH_3	CH_2Br
F	CN	CHCl	1	2	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	2	CO_2CH_3	CH_2Br
F	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CH_2	1	1	H	CH_2Cl
Cl	H	CH_2	1	1	H	CH_2Br
Cl	H	CH_2	1	2	H	CH_2Cl
Cl	H	CH_2	1	2	H	CH_2Br
Cl	H	CHF	1	1	H	CH_2Cl
Cl	H	CHF	1	1	H	CH_2Br
Cl	H	CHF	1	2	H	CH_2Cl
Cl	H	CHF	1	2	H	CH_2Br
Cl	H	CHCl	1	1	H	CH_2Cl
Cl	H	CHCl	1	1	H	CH_2Br
Cl	H	CHCl	1	2	H	CH_2Cl
Cl	H	CHCl	1	2	H	CH_2Br
Cl	Cl	CH_2	1	1	H	CH_2Cl
Cl	Cl	CH_2	1	1	H	CH_2Br
Cl	Cl	CH_2	1	1	C(=O)CH_3	CH_2Cl
Cl	Cl	CH_2	1	1	C(=O)CH_3	CH_2Br
Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CH_2	1	2	H	CH_2Cl
Cl	Cl	CH_2	1	2	H	CH_2Br
Cl	Cl	CH_2	1	2	C(=O)CH_3	CH_2Cl
Cl	Cl	CH_2	1	2	C(=O)CH_3	CH_2Br

Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	1	H	CH_2Cl
Cl	Cl	CHF	1	1	H	CH_2Br
Cl	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	2	H	CH_2Cl
Cl	Cl	CHF	1	2	H	CH_2Br
Cl	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	1	H	CH_2Cl
Cl	Cl	CHCl	1	1	H	CH_2Br
Cl	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	2	H	CH_2Cl
Cl	Cl	CHCl	1	2	H	CH_2Br
Cl	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	1	H	CH_2Cl
Cl	Br	CH_2	1	1	H	CH_2Br

Cl	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	2	H	CH_2Cl
Cl	Br	CH_2	1	2	H	CH_2Br
Cl	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	1	H	CH_2Cl
Cl	Br	CHF	1	1	H	CH_2Br
Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	2	H	CH_2Cl
Cl	Br	CHF	1	2	H	CH_2Br
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHCl	1	1	H	CH_2Cl
Cl	Br	CHCl	1	1	H	CH_2Br
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br

Cl	Br	CHCl	1	2	H	CH_2Cl
Cl	Br	CHCl	1	2	H	CH_2Br
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CH_2	1	1	H	CH_2Cl
Cl	CN	CH_2	1	1	H	CH_2Br
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CH_2	1	2	H	CH_2Cl
Cl	CN	CH_2	1	2	H	CH_2Br
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHF	1	1	H	CH_2Cl
Cl	CN	CHF	1	1	H	CH_2Br
Cl	CN	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Br
Cl	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHF	1	2	H	CH_2Cl
Cl	CN	CHF	1	2	H	CH_2Br
Cl	CN	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Br

Cl	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHCl	1	1	H	CH_2Cl
Cl	CN	CHCl	1	1	H	CH_2Br
Cl	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHCl	1	2	H	CH_2Cl
Cl	CN	CHCl	1	2	H	CH_2Br
Cl	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br

J = 6 and Q = O

X	Y	Z	n	m	R^1	R^2
F	H	CH_2	1	1	H	CH_2Cl
F	H	CH_2	1	1	H	CH_2Br
F	H	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	H	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	H	CH_2	1	1	CO_2CH_3	CH_2Cl
F	H	CH_2	1	1	CO_2CH_3	CH_2Br
F	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	H	CH_2	1	2	H	CH_2Cl
F	H	CH_2	1	2	H	CH_2Br
F	H	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	H	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	H	CH_2	1	2	CO_2CH_3	CH_2Cl
F	H	CH_2	1	2	CO_2CH_3	CH_2Br
F	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br

F	H	CHF	1	1	H	CH_2Cl
F	H	CHF	1	1	H	CH_2Br
F	H	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	H	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	H	CHF	1	1	CO_2CH_3	CH_2Cl
F	H	CHF	1	1	CO_2CH_3	CH_2Br
F	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	H	CHF	1	2	H	CH_2Cl
F	H	CHF	1	2	H	CH_2Br
F	H	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	H	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	H	CHF	1	2	CO_2CH_3	CH_2Cl
F	H	CHF	1	2	CO_2CH_3	CH_2Br
F	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	H	CHCl	1	1	H	CH_2Cl
F	H	CHCl	1	1	H	CH_2Br
F	H	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	H	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	H	CHCl	1	1	CO_2CH_3	CH_2Cl
F	H	CHCl	1	1	CO_2CH_3	CH_2Br
F	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	H	CHCl	1	2	H	CH_2Cl
F	H	CHCl	1	2	H	CH_2Br
F	H	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	H	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	H	CHCl	1	2	CO_2CH_3	CH_2Cl
F	H	CHCl	1	2	CO_2CH_3	CH_2Br
F	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CH_2	1	1	H	CH_2Cl
F	Cl	CH_2	1	1	H	CH_2Br
F	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl
F	Cl	CH_2	1	1	CO_2CH_3	CH_2Br

F	Cl	CH_2	1	1	$CH_2C\equiv CH$	CH_2Cl
F	Cl	CH_2	1	1	$CH_2C\equiv CH$	CH_2Br
F	Cl	CH_2	1	2	H	CH_2Cl
F	Cl	CH_2	1	2	H	CH_2Br
F	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Br
F	Cl	CH_2	1	2	$CH_2C\equiv CH$	CH_2Cl
F	Cl	CH_2	1	2	$CH_2C\equiv CH$	CH_2Br
F	Cl	CHF	1	1	H	CH_2Cl
F	Cl	CHF	1	1	H	CH_2Br
F	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	1	CO_2CH_3	CH_2Br
F	Cl	CHF	1	1	$CH_2C\equiv CH$	CH_2Cl
F	Cl	CHF	1	1	$CH_2C\equiv CH$	CH_2Br
F	Cl	CHF	1	2	H	CH_2Cl
F	Cl	CHF	1	2	H	CH_2Br
F	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	2	CO_2CH_3	CH_2Br
F	Cl	CHF	1	2	$CH_2C\equiv CH$	CH_2Cl
F	Cl	CHF	1	2	$CH_2C\equiv CH$	CH_2Br
F	Cl	CHCl	1	1	H	CH_2Cl
F	Cl	CHCl	1	1	H	CH_2Br
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	1	$CH_2C\equiv CH$	CH_2Cl
F	Cl	CHCl	1	1	$CH_2C\equiv CH$	CH_2Br
F	Cl	CHCl	1	2	H	CH_2Cl
F	Cl	CHCl	1	2	H	CH_2Br
F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Br

F	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	1	H	CH_2Cl
F	Br	CH_2	1	1	H	CH_2Br
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	1	CO_2CH_3	CH_2Br
F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	2	H	CH_2Cl
F	Br	CH_2	1	2	H	CH_2Br
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	2	CO_2CH_3	CH_2Br
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHF	1	1	H	CH_2Cl
F	Br	CHF	1	1	H	CH_2Br
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CHF	1	1	CO_2CH_3	CH_2Cl
F	Br	CHF	1	1	CO_2CH_3	CH_2Br
F	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHF	1	2	H	CH_2Cl
F	Br	CHF	1	2	H	CH_2Br
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CHF	1	2	CO_2CH_3	CH_2Cl
F	Br	CHF	1	2	CO_2CH_3	CH_2Br
F	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHCl	1	1	H	CH_2Cl
F	Br	CHCl	1	1	H	CH_2Br

F	Br	CHCl	1	1	C(=O)CH_3	CH_2Cl
F	Br	CHCl	1	1	C(=O)CH_3	CH_2Br
F	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	1	CO_2CH_3	CH_2Br
F	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHCl	1	2	H	CH_2Cl
F	Br	CHCl	1	2	H	CH_2Br
F	Br	CHCl	1	2	C(=O)CH_3	CH_2Cl
F	Br	CHCl	1	2	C(=O)CH_3	CH_2Br
F	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	2	CO_2CH_3	CH_2Br
F	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CH_2	1	1	H	CH_2Cl
F	CN	CH_2	1	1	H	CH_2Br
F	CN	CH_2	1	1	C(=O)CH_3	CH_2Cl
F	CN	CH_2	1	1	C(=O)CH_3	CH_2Br
F	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	1	CO_2CH_3	CH_2Br
F	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CH_2	1	2	H	CH_2Cl
F	CN	CH_2	1	2	H	CH_2Br
F	CN	CH_2	1	2	C(=O)CH_3	CH_2Cl
F	CN	CH_2	1	2	C(=O)CH_3	CH_2Br
F	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	2	CO_2CH_3	CH_2Br
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHF	1	1	H	CH_2Cl
F	CN	CHF	1	1	H	CH_2Br
F	CN	CHF	1	1	C(=O)CH_3	CH_2Cl
F	CN	CHF	1	1	C(=O)CH_3	CH_2Br
F	CN	CHF	1	1	CO_2CH_3	CH_2Cl
F	CN	CHF	1	1	CO_2CH_3	CH_2Br
F	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br

F	CN	CHF	1	2	H	CH_2Cl
F	CN	CHF	1	2	H	CH_2Br
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CHF	1	2	CO_2CH_3	CH_2Cl
F	CN	CHF	1	2	CO_2CH_3	CH_2Br
F	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHCl	1	1	H	CH_2Cl
F	CN	CHCl	1	1	H	CH_2Br
F	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	1	CO_2CH_3	CH_2Br
F	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHCl	1	2	H	CH_2Cl
F	CN	CHCl	1	2	H	CH_2Br
F	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CHCl	1	2	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	2	CO_2CH_3	CH_2Br
F	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CH_2	1	1	H	CH_2Cl
Cl	H	CH_2	1	1	H	CH_2Br
Cl	H	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	H	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	H	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	H	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CH_2	1	2	H	CH_2Cl
Cl	H	CH_2	1	2	H	CH_2Br
Cl	H	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	H	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	H	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	H	CH_2	1	2	CO_2CH_3	CH_2Br

Cl	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHF	1	1	H	CH_2Cl
Cl	H	CHF	1	1	H	CH_2Br
Cl	H	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	H	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	H	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	H	CHF	1	1	CO_2CH_3	CH_2Br
Cl	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHF	1	2	H	CH_2Cl
Cl	H	CHF	1	2	H	CH_2Br
Cl	H	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	H	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	H	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	H	CHF	1	2	CO_2CH_3	CH_2Br
Cl	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHCl	1	1	H	CH_2Cl
Cl	H	CHCl	1	1	H	CH_2Br
Cl	H	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	H	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	H	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	H	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHCl	1	2	H	CH_2Cl
Cl	H	CHCl	1	2	H	CH_2Br
Cl	H	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	H	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	H	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	H	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CH_2	1	1	H	CH_2Cl
Cl	Cl	CH_2	1	1	H	CH_2Br
Cl	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Br

Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CH_2	1	2	H	CH_2Cl
Cl	Cl	CH_2	1	2	H	CH_2Br
Cl	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	1	H	CH_2Cl
Cl	Cl	CHF	1	1	H	CH_2Br
Cl	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	2	H	CH_2Cl
Cl	Cl	CHF	1	2	H	CH_2Br
Cl	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	1	H	CH_2Cl
Cl	Cl	CHCl	1	1	H	CH_2Br
Cl	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	2	H	CH_2Cl
Cl	Cl	CHCl	1	2	H	CH_2Br

Cl	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	1	H	CH_2Cl
Cl	Br	CH_2	1	1	H	CH_2Br
Cl	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	2	H	CH_2Cl
Cl	Br	CH_2	1	2	H	CH_2Br
Cl	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	1	H	CH_2Cl
Cl	Br	CHF	1	1	H	CH_2Br
Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	2	H	CH_2Cl
Cl	Br	CHF	1	2	H	CH_2Br
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br

Cl	Br	CHCl	1	1	H	CH_2Cl
Cl	Br	CHCl	1	1	H	CH_2Br
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHCl	1	2	H	CH_2Cl
Cl	Br	CHCl	1	2	H	CH_2Br
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CH_2	1	1	H	CH_2Cl
Cl	CN	CH_2	1	1	H	CH_2Br
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CH_2	1	2	H	CH_2Cl
Cl	CN	CH_2	1	2	H	CH_2Br
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHF	1	1	H	CH_2Cl
Cl	CN	CHF	1	1	H	CH_2Br
Cl	CN	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Br

Cl	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHF	1	2	H	CH_2Cl
Cl	CN	CHF	1	2	H	CH_2Br
Cl	CN	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Br
Cl	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHCl	1	1	H	CH_2Cl
Cl	CN	CHCl	1	1	H	CH_2Br
Cl	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHCl	1	2	H	CH_2Cl
Cl	CN	CHCl	1	2	H	CH_2Br
Cl	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br

J = 6, X = F, Y = Cl, n = m = 1, and Q = O

Z	R^1	R^2
CHF	H	CH_2F
CHF	H	CH_2OCH_3
CHF	H	CH_2CN
CHF	H	CH_2SCH_3
CHF	H	$CH_2SO_2CH_3$
CHF	H	$CHCl_2$
CHF	H	CH_2CH_2Cl
CHF	$C(=O)CH_3$	CH_2F

CHF	$C(=O)CH_3$	CH_2OCH_3
CHF	$C(=O)CH_3$	CH_2CN
CHF	$C(=O)CH_3$	CH_2SCH_3
CHF	$C(=O)CH_3$	$CH_2SO_2CH_3$
CHF	$C(=O)CH_3$	$CHCl_2$
CHF	$C(=O)CH_3$	CH_2CH_2Cl
CHF	CO_2CH_3	CH_2F
CHF	CO_2CH_3	CH_2OCH_3
CHF	CO_2CH_3	CH_2CN
CHF	CO_2CH_3	CH_2SCH_3
CHF	CO_2CH_3	$CH_2SO_2CH_3$
CHF	CO_2CH_3	$CHCl_2$
CHF	CO_2CH_3	CH_2CH_2Cl
CHF	$CH_2C{\equiv}CH$	CH_2F
CHF	$CH_2C{\equiv}CH$	CH_2OCH_3
CHF	$CH_2C{\equiv}CH$	CH_2CN
CHF	$CH_2C{\equiv}CH$	CH_2SCH_3
CHF	$CH_2C{\equiv}CH$	$CH_2SO_2CH_3$
CHF	$CH_2C{\equiv}CH$	$CHCl_2$
CHF	$CH_2C{\equiv}CH$	CH_2CH_2Cl
CHCl	H	CH_2F
CHCl	H	CH_2OCH_3
CHCl	H	CH_2CN
CHCl	H	CH_2SCH_3
CHCl	H	$CH_2SO_2CH_3$
CHCl	H	$CHCl_2$
CHCl	H	CH_2CH_2Cl
CHCl	$C(=O)CH_3$	CH_2F
CHCl	$C(=O)CH_3$	CH_2OCH_3
CHCl	$C(=O)CH_3$	CH_2CN
CHCl	$C(=O)CH_3$	CH_2SCH_3
CHCl	$C(=O)CH_3$	$CH_2SO_2CH_3$
CHCl	$C(=O)CH_3$	$CHCl_2$
CHCl	$C(=O)CH_3$	CH_2CH_2Cl
CHCl	CO_2CH_3	CH_2F
CHCl	CO_2CH_3	CH_2OCH_3
CHCl	CO_2CH_3	CH_2CN
CHCl	CO_2CH_3	CH_2SCH_3

CHCl	CO_2CH_3	$CH_2SO_2CH_3$
CHCl	CO_2CH_3	$CHCl_2$
CHCl	CO_2CH_3	CH_2CH_2Cl
CHCl	$CH_2C{\equiv}CH$	CH_2F
CHCl	$CH_2C{\equiv}CH$	CH_2OCH_3
CHCl	$CH_2C{\equiv}CH$	CH_2CN
CHCl	$CH_2C{\equiv}CH$	CH_2SCH_3
CHCl	$CH_2C{\equiv}CH$	$CH_2SO_2CH_3$
CHCl	$CH_2C{\equiv}CH$	$CHCl_2$
CHCl	$CH_2C{\equiv}CH$	CH_2CH_2Cl
CHBr	H	CH_2Cl
CHBr	H	CH_2F
CHBr	H	CH_2OCH_3
CHBr	H	CH_2CN
CHBr	H	CH_2SCH_3
CHBr	H	$CH_2SO_2CH_3$
CHBr	H	$CHCl_2$
CHBr	H	CH_2CH_2Cl
CHBr	$C(=O)CH_3$	CH_2Cl
CHBr	$C(=O)CH_3$	CH_2F
CHBr	$C(=O)CH_3$	CH_2OCH_3
CHBr	$C(=O)CH_3$	CH_2CN
CHBr	$C(=O)CH_3$	CH_2SCH_3
CHBr	$C(=O)CH_3$	$CH_2SO_2CH_3$
CHBr	$C(=O)CH_3$	$CHCl_2$
CHBr	$C(=O)CH_3$	CH_2CH_2Cl
CHBr	CO_2CH_3	CH_2Cl
CHBr	CO_2CH_3	CH_2F
CHBr	CO_2CH_3	CH_2OCH_3
CHBr	CO_2CH_3	CH_2CN
CHBr	CO_2CH_3	CH_2SCH_3
CHBr	CO_2CH_3	$CH_2SO_2CH_3$
CHBr	CO_2CH_3	$CHCl_2$
CHBr	CO_2CH_3	CH_2CH_2Cl
CHBr	$CH_2C{\equiv}CH$	CH_2Cl
CHBr	$CH_2C{\equiv}CH$	CH_2F
CHBr	$CH_2C{\equiv}CH$	CH_2OCH_3
CHBr	$CH_2C{\equiv}CH$	CH_2CN

CHBr	$CH_2C{\equiv}CH$	CH_2SCH_3
CHBr	$CH_2C{\equiv}CH$	$CH_2SO_2CH_3$
CHBr	$CH_2C{\equiv}CH$	$CHCl_2$
CHBr	$CH_2C{\equiv}CH$	CH_2CH_2Cl
CHCl	C(=O)Ph	CH_2Cl
CHCl	$C(=O)CHCl_2$	CH_2Cl
CHCl	$C(=O)CH(Cl)CH_3$	CH_2Cl
CHCl	$C(=O)(CH_2)_{18}CH_3$	CH_2Cl
CHCl	$C(=O)CH_2Cl$	CH_2Cl
CHCl	$C(=O)CH_2CH_3$	CH_2Cl
CHCl	$C(=O)CH(CH_3)_2$	CH_2Cl
CHCl	$C(=O)CH(CH_2)_2$	CH_2Cl

J = 7, Y = Cl, and $R^2 = CH_2Cl$

X	R^1	R^{16}
F	H	CH_3
F	$C(=O)CH_3$	CH_3
F	CO_2CH_3	CH_3
F	H	CF_3
F	$C(=O)CH_3$	CF_3
F	CO_2CH_3	CF_3
Cl	H	CH_3
Cl	$C(=O)CH_3$	CH_3
Cl	CO_2CH_3	CH_3
Cl	H	CF_3
Cl	$C(=O)CH_3$	CF_3
Cl	CO_2CH_3	CF_3

J = 8, Y = Cl, Q = O, n = m = 1, $R^2 = CH_2Cl$, and $R^{17} = R^{18} = H$

X	R^1	Z
F	H	CH_2
F	$C(=O)CH_3$	CH_2
F	CO_2CH_3	CH_2
F	H	CHF
F	$C(=O)CH_3$	CHF
F	CO_2CH_3	CHF
Cl	H	CH_2

Cl	C(=O)CH_3	CH_2
Cl	CO_2CH_3	CH_2
Cl	H	CHF
Cl	C(=O)CH_3	CHF
Cl	CO_2CH_3	CHF

J = 9, Q = O, Q^1 = S, Y = Cl, and R^2 = CH_2Cl

X	R^1	R^{19}	R^{20}
F	H	CH_3	CH_3
F	C(=O)CH_3	CH_3	CH_3
F	CO_2CH_3	CH_3	CH_3
F	H	CH_2CH_3	CH_3
F	C(=O)CH_3	CH_2CH_3	CH_3
F	CO_2CH_3	CH_2CH_3	CH_3
F	H	$CH_2C{\equiv}CH$	CH_3
F	C(=O)CH_3	$CH_2C{\equiv}CH$	CH_3
F	CO_2CH_3	$CH_2C{\equiv}CH$	CH_3
F	H	CF_3	CH_3
F	C(=O)CH_3	CF_3	CH_3
F	CO_2CH_3	CF_3	CH_3
F	H	CH_3	CH_2CH_3
F	C(=O)CH_3	CH_3	CH_2CH_3
F	CO_2CH_3	CH_3	CH_2CH_3
F	H	CH_2CH_3	CH_2CH_3
F	C(=O)CH_3	CH_2CH_3	CH_2CH_3
F	CO_2CH_3	CH_2CH_3	CH_2CH_3
F	H	$CH_2C{\equiv}CH$	CH_2CH_3
F	C(=O)CH_3	$CH_2C{\equiv}CH$	CH_2CH_3
F	CO_2CH_3	$CH_2C{\equiv}CH$	CH_2CH_3
F	H	CF_3	CH_2CH_3
F	C(=O)CH_3	CF_3	CH_2CH_3
F	CO_2CH_3	CF_3	CH_2CH_3
F	H	CH_3	$CH_2C{\equiv}CH$
F	C(=O)CH_3	CH_3	$CH_2C{\equiv}CH$
F	CO_2CH_3	CH_3	$CH_2C{\equiv}CH$
F	H	CH_2CH_3	$CH_2C{\equiv}CH$
F	C(=O)CH_3	CH_2CH_3	$CH_2C{\equiv}CH$
F	CO_2CH_3	CH_2CH_3	$CH_2C{\equiv}CH$

F	H	$CH_2C{\equiv}CH$	$CH_2C{\equiv}CH$
F	$C(=O)CH_3$	$CH_2C{\equiv}CH$	$CH_2C{\equiv}CH$
F	CO_2CH_3	$CH_2C{\equiv}CH$	$CH_2C{\equiv}CH$
F	H	CF_3	$CH_2C{\equiv}CH$
F	$C(=O)CH_3$	CF_3	$CH_2C{\equiv}CH$
F	CO_2CH_3	CF_3	$CH_2C{\equiv}CH$
F	H	CH_3	CF_3
F	$C(=O)CH_3$	CH_3	CF_3
F	CO_2CH_3	CH_3	CF_3
F	H	CH_2CH_3	CF_3
F	$C(=O)CH_3$	CH_2CH_3	CF_3
F	CO_2CH_3	CH_2CH_3	CF_3
F	H	$CH_2C{\equiv}CH$	CF_3
F	$C(=O)CH_3$	$CH_2C{\equiv}CH$	CF_3
F	CO_2CH_3	$CH_2C{\equiv}CH$	CF_3
F	H	CF_3	CF_3
F	$C(=O)CH_3$	CF_3	CF_3
F	CO_2CH_3	CF_3	CF_3
Cl	H	CH_3	CH_3
Cl	$C(=O)CH_3$	CH_3	CH_3
Cl	CO_2CH_3	CH_3	CH_3
Cl	H	CH_2CH_3	CH_3
Cl	$C(=O)CH_3$	CH_2CH_3	CH_3
Cl	CO_2CH_3	CH_2CH_3	CH_3
Cl	H	$CH_2C{\equiv}CH$	CH_3
Cl	$C(=O)CH_3$	$CH_2C{\equiv}CH$	CH_3
Cl	CO_2CH_3	$CH_2C{\equiv}CH$	CH_3
Cl	H	CF_3	CH_3
Cl	$C(=O)CH_3$	CF_3	CH_3
Cl	CO_2CH_3	CF_3	CH_3
Cl	H	CH_3	CH_2CH_3
Cl	$C(=O)CH_3$	CH_3	CH_2CH_3
Cl	CO_2CH_3	CH_3	CH_2CH_3
Cl	H	CH_2CH_3	CH_2CH_3
Cl	$C(=O)CH_3$	CH_2CH_3	CH_2CH_3
Cl	CO_2CH_3	CH_2CH_3	CH_2CH_3
Cl	H	$CH_2C{\equiv}CH$	CH_2CH_3
Cl	$C(=O)CH_3$	$CH_2C{\equiv}CH$	CH_2CH_3

Cl	CO_2CH_3	$CH_2C{\equiv}CH$	CH_2CH_3
Cl	H	CF_3	CH_2CH_3
Cl	C(=O)CH_3	CF_3	CH_2CH_3
Cl	CO_2CH_3	CF_3	CH_2CH_3
Cl	H	CH_3	$CH_2C{\equiv}CH$
Cl	C(=O)CH_3	CH_3	$CH_2C{\equiv}CH$
Cl	CO_2CH_3	CH_3	$CH_2C{\equiv}CH$
Cl	H	CH_2CH_3	$CH_2C{\equiv}CH$
Cl	C(=O)CH_3	CH_2CH_3	$CH_2C{\equiv}CH$
Cl	CO_2CH_3	CH_2CH_3	$CH_2C{\equiv}CH$
Cl	H	$CH_2C{\equiv}CH$	$CH_2C{\equiv}CH$
Cl	C(=O)CH_3	$CH_2C{\equiv}CH$	$CH_2C{\equiv}CH$
Cl	CO_2CH_3	$CH_2C{\equiv}CH$	$CH_2C{\equiv}CH$
Cl	H	CF_3	$CH_2C{\equiv}CH$
Cl	C(=O)CH_3	CF_3	$CH_2C{\equiv}CH$
Cl	CO_2CH_3	CF_3	$CH_2C{\equiv}CH$
Cl	H	CH_3	CF_3
Cl	C(=O)CH_3	CH_3	CF_3
Cl	CO_2CH_3	CH_3	CF_3
Cl	H	CH_2CH_3	CF_3
Cl	C(=O)CH_3	CH_2CH_3	CF_3
Cl	CO_2CH_3	CH_2CH_3	CF_3
Cl	H	$CH_2C{\equiv}CH$	CF_3
Cl	C(=O)CH_3	$CH_2C{\equiv}CH$	CF_3
Cl	CO_2CH_3	$CH_2C{\equiv}CH$	CF_3
Cl	H	CF_3	CF_3
Cl	C(=O)CH_3	CF_3	CF_3
Cl	CO_2CH_3	CF_3	CF_3

J = 10, Q^1 = S, Y = Cl, and R^2 = CH_2Cl

X	R^1	Z	n	m
F	H	CH_2	1	1
F	C(=O)CH_3	CH_2	1	1
F	CO_2CH_3	CH_2	1	1
F	H	CHF	1	1
F	C(=O)CH_3	CHF	1	1
F	CO_2CH_3	CHF	1	1
F	H	CH_2	1	2

F	$C(=O)CH_3$	CH_2	1	2
F	CO_2CH_3	CH_2	1	2
F	H	CHF	1	2
F	$C(=O)CH_3$	CHF	1	2
F	CO_2CH_3	CHF	1	2
Cl	H	CH_2	1	1
Cl	$C(=O)CH_3$	CH_2	1	1
Cl	CO_2CH_3	CH_2	1	1
Cl	H	CHF	1	1
Cl	$C(=O)CH_3$	CHF	1	1
Cl	CO_2CH_3	CHF	1	1
Cl	H	CH_2	1	2
Cl	$C(=O)CH_3$	CH_2	1	2
Cl	CO_2CH_3	CH_2	1	2
Cl	H	CHF	1	2
Cl	$C(=O)CH_3$	CHF	1	2
Cl	CO_2CH_3	CHF	1	2

<u>J = 11 and R^{21} = Cl</u>

X	Y	Z	n	m	R^1	R^2
F	H	CH_2	1	1	H	CH_2Cl
F	H	CH_2	1	1	H	CH_2Br
F	H	CH_2	1	2	H	CH_2Cl
F	H	CH_2	1	2	H	CH_2Br
F	H	CHF	1	1	H	CH_2Cl
F	H	CHF	1	1	H	CH_2Br
F	H	CHF	1	2	H	CH_2Cl
F	H	CHF	1	2	H	CH_2Br
F	H	CHCl	1	1	H	CH_2Cl
F	H	CHCl	1	1	H	CH_2Br
F	H	CHCl	1	2	H	CH_2Cl
F	H	CHCl	1	2	H	CH_2Br
F	Cl	CH_2	1	1	H	CH_2Cl
F	Cl	CH_2	1	1	H	CH_2Br
F	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl

F	Cl	CH_2	1	1	CO_2CH_3	CH_2Br
F	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CH_2	1	2	H	CH_2Cl
F	Cl	CH_2	1	2	H	CH_2Br
F	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Br
F	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHF	1	1	H	CH_2Cl
F	Cl	CHF	1	1	H	CH_2Br
F	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	1	CO_2CH_3	CH_2Br
F	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHF	1	2	H	CH_2Cl
F	Cl	CHF	1	2	H	CH_2Br
F	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	2	CO_2CH_3	CH_2Br
F	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHCl	1	1	H	CH_2Cl
F	Cl	CHCl	1	1	H	CH_2Br
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHCl	1	2	H	CH_2Cl
F	Cl	CHCl	1	2	H	CH_2Br
F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Cl

F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	1	H	CH_2Cl
F	Br	CH_2	1	1	H	CH_2Br
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	1	CO_2CH_3	CH_2Br
F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	2	H	CH_2Cl
F	Br	CH_2	1	2	H	CH_2Br
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	2	CO_2CH_3	CH_2Br
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHF	1	1	H	CH_2Cl
F	Br	CHF	1	1	H	CH_2Br
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CHF	1	1	CO_2CH_3	CH_2Cl
F	Br	CHF	1	1	CO_2CH_3	CH_2Br
F	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHF	1	2	H	CH_2Cl
F	Br	CHF	1	2	H	CH_2Br
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CHF	1	2	CO_2CH_3	CH_2Cl
F	Br	CHF	1	2	CO_2CH_3	CH_2Br
F	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHCl	1	1	H	CH_2Cl

F	Br	CHCl	1	1	H	CH_2Br
F	Br	CHCl	1	1	C(=O)CH_3	CH_2Cl
F	Br	CHCl	1	1	C(=O)CH_3	CH_2Br
F	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	1	CO_2CH_3	CH_2Br
F	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHCl	1	2	H	CH_2Cl
F	Br	CHCl	1	2	H	CH_2Br
F	Br	CHCl	1	2	C(=O)CH_3	CH_2Cl
F	Br	CHCl	1	2	C(=O)CH_3	CH_2Br
F	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	2	CO_2CH_3	CH_2Br
F	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CH_2	1	1	H	CH_2Cl
F	CN	CH_2	1	1	H	CH_2Br
F	CN	CH_2	1	1	C(=O)CH_3	CH_2Cl
F	CN	CH_2	1	1	C(=O)CH_3	CH_2Br
F	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	1	CO_2CH_3	CH_2Br
F	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CH_2	1	2	H	CH_2Cl
F	CN	CH_2	1	2	H	CH_2Br
F	CN	CH_2	1	2	C(=O)CH_3	CH_2Cl
F	CN	CH_2	1	2	C(=O)CH_3	CH_2Br
F	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	2	CO_2CH_3	CH_2Br
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHF	1	1	H	CH_2Cl
F	CN	CHF	1	1	H	CH_2Br
F	CN	CHF	1	1	C(=O)CH_3	CH_2Cl
F	CN	CHF	1	1	C(=O)CH_3	CH_2Br
F	CN	CHF	1	1	CO_2CH_3	CH_2Cl
F	CN	CHF	1	1	CO_2CH_3	CH_2Br
F	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl

F	CN	CHF	1	1	$CH_2C\equiv CH$	CH_2Br
F	CN	CHF	1	2	H	CH_2Cl
F	CN	CHF	1	2	H	CH_2Br
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CHF	1	2	CO_2CH_3	CH_2Cl
F	CN	CHF	1	2	CO_2CH_3	CH_2Br
F	CN	CHF	1	2	$CH_2C\equiv CH$	CH_2Cl
F	CN	CHF	1	2	$CH_2C\equiv CH$	CH_2Br
F	CN	CHCl	1	1	H	CH_2Cl
F	CN	CHCl	1	1	H	CH_2Br
F	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	1	CO_2CH_3	CH_2Br
F	CN	CHCl	1	1	$CH_2C\equiv CH$	CH_2Cl
F	CN	CHCl	1	1	$CH_2C\equiv CH$	CH_2Br
F	CN	CHCl	1	2	H	CH_2Cl
F	CN	CHCl	1	2	H	CH_2Br
F	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CHCl	1	2	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	2	CO_2CH_3	CH_2Br
F	CN	CHCl	1	2	$CH_2C\equiv CH$	CH_2Cl
F	CN	CHCl	1	2	$CH_2C\equiv CH$	CH_2Br
Cl	H	CH_2	1	1	H	CH_2Cl
Cl	H	CH_2	1	1	H	CH_2Br
Cl	H	CH_2	1	2	H	CH_2Cl
Cl	H	CH_2	1	2	H	CH_2Br
Cl	H	CHF	1	1	H	CH_2Cl
Cl	H	CHF	1	1	H	CH_2Br
Cl	H	CHF	1	2	H	CH_2Cl
Cl	H	CHF	1	2	H	CH_2Br
Cl	H	CHCl	1	1	H	CH_2Cl
Cl	H	CHCl	1	1	H	CH_2Br
Cl	H	CHCl	1	2	H	CH_2Cl
Cl	H	CHCl	1	2	H	CH_2Br
Cl	Cl	CH_2	1	1	H	CH_2Cl

Cl	Cl	CH_2	1	1	H	CH_2Br
Cl	Cl	CH_2	1	1	C(=O)CH_3	CH_2Cl
Cl	Cl	CH_2	1	1	C(=O)CH_3	CH_2Br
Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CH_2	1	2	H	CH_2Cl
Cl	Cl	CH_2	1	2	H	CH_2Br
Cl	Cl	CH_2	1	2	C(=O)CH_3	CH_2Cl
Cl	Cl	CH_2	1	2	C(=O)CH_3	CH_2Br
Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	1	H	CH_2Cl
Cl	Cl	CHF	1	1	H	CH_2Br
Cl	Cl	CHF	1	1	C(=O)CH_3	CH_2Cl
Cl	Cl	CHF	1	1	C(=O)CH_3	CH_2Br
Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	2	H	CH_2Cl
Cl	Cl	CHF	1	2	H	CH_2Br
Cl	Cl	CHF	1	2	C(=O)CH_3	CH_2Cl
Cl	Cl	CHF	1	2	C(=O)CH_3	CH_2Br
Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	1	H	CH_2Cl
Cl	Cl	CHCl	1	1	H	CH_2Br
Cl	Cl	CHCl	1	1	C(=O)CH_3	CH_2Cl
Cl	Cl	CHCl	1	1	C(=O)CH_3	CH_2Br
Cl	Cl	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl

Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	2	H	CH_2Cl
Cl	Cl	CHCl	1	2	H	CH_2Br
Cl	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	1	H	CH_2Cl
Cl	Br	CH_2	1	1	H	CH_2Br
Cl	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	2	H	CH_2Cl
Cl	Br	CH_2	1	2	H	CH_2Br
Cl	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	1	H	CH_2Cl
Cl	Br	CHF	1	1	H	CH_2Br
Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	2	H	CH_2Cl
Cl	Br	CHF	1	2	H	CH_2Br
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	2	CO_2CH_3	CH_2Cl

Cl	Br	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHCl	1	1	H	CH_2Cl
Cl	Br	CHCl	1	1	H	CH_2Br
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHCl	1	2	H	CH_2Cl
Cl	Br	CHCl	1	2	H	CH_2Br
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CH_2	1	1	H	CH_2Cl
Cl	CN	CH_2	1	1	H	CH_2Br
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CH_2	1	2	H	CH_2Cl
Cl	CN	CH_2	1	2	H	CH_2Br
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHF	1	1	H	CH_2Cl
Cl	CN	CHF	1	1	H	CH_2Br
Cl	CN	CHF	1	1	$C(=O)CH_3$	CH_2Cl

Cl	CN	CHF	1	1	C(=O)CH_3	CH_2Br
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Br
Cl	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHF	1	2	H	CH_2Cl
Cl	CN	CHF	1	2	H	CH_2Br
Cl	CN	CHF	1	2	C(=O)CH_3	CH_2Cl
Cl	CN	CHF	1	2	C(=O)CH_3	CH_2Br
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Br
Cl	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHCl	1	1	H	CH_2Cl
Cl	CN	CHCl	1	1	H	CH_2Br
Cl	CN	CHCl	1	1	C(=O)CH_3	CH_2Cl
Cl	CN	CHCl	1	1	C(=O)CH_3	CH_2Br
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHCl	1	2	H	CH_2Cl
Cl	CN	CHCl	1	2	H	CH_2Br
Cl	CN	CHCl	1	2	C(=O)CH_3	CH_2Cl
Cl	CN	CHCl	1	2	C(=O)CH_3	CH_2Br
Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br

J = 11 and R^{21} = Br

X	Y	Z	n	m	R^1	R^2
F	H	CH_2	1	1	H	CH_2Cl
F	H	CH_2	1	1	H	CH_2Br
F	H	CH_2	1	2	H	CH_2Cl
F	H	CH_2	1	2	H	CH_2Br
F	H	CHF	1	1	H	CH_2Cl

F	H	CHF	1	1	H	CH_2Br
F	H	CHF	1	2	H	CH_2Cl
F	H	CHF	1	2	H	CH_2Br
F	H	CHCl	1	1	H	CH_2Cl
F	H	CHCl	1	1	H	CH_2Br
F	H	CHCl	1	2	H	CH_2Cl
F	H	CHCl	1	2	H	CH_2Br
F	Cl	CH_2	1	1	H	CH_2Cl
F	Cl	CH_2	1	1	H	CH_2Br
F	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl
F	Cl	CH_2	1	1	CO_2CH_3	CH_2Br
F	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CH_2	1	2	H	CH_2Cl
F	Cl	CH_2	1	2	H	CH_2Br
F	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Br
F	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHF	1	1	H	CH_2Cl
F	Cl	CHF	1	1	H	CH_2Br
F	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	1	CO_2CH_3	CH_2Br
F	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHF	1	2	H	CH_2Cl
F	Cl	CHF	1	2	H	CH_2Br
F	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	2	CO_2CH_3	CH_2Br
F	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl

F	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHCl	1	1	H	CH_2Cl
F	Cl	CHCl	1	1	H	CH_2Br
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHCl	1	2	H	CH_2Cl
F	Cl	CHCl	1	2	H	CH_2Br
F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	1	H	CH_2Cl
F	Br	CH_2	1	1	H	CH_2Br
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	1	CO_2CH_3	CH_2Br
F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	2	H	CH_2Cl
F	Br	CH_2	1	2	H	CH_2Br
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	2	CO_2CH_3	CH_2Br
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHF	1	1	H	CH_2Cl
F	Br	CHF	1	1	H	CH_2Br
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CHF	1	1	CO_2CH_3	CH_2Cl

F	Br	CHF	1	1	CO_2CH_3	CH_2Br
F	Br	CHF	1	1	$CH_2C\equiv CH$	CH_2Cl
F	Br	CHF	1	1	$CH_2C\equiv CH$	CH_2Br
F	Br	CHF	1	2	H	CH_2Cl
F	Br	CHF	1	2	H	CH_2Br
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CHF	1	2	CO_2CH_3	CH_2Cl
F	Br	CHF	1	2	CO_2CH_3	CH_2Br
F	Br	CHF	1	2	$CH_2C\equiv CH$	CH_2Cl
F	Br	CHF	1	2	$CH_2C\equiv CH$	CH_2Br
F	Br	CHCl	1	1	H	CH_2Cl
F	Br	CHCl	1	1	H	CH_2Br
F	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	1	CO_2CH_3	CH_2Br
F	Br	CHCl	1	1	$CH_2C\equiv CH$	CH_2Cl
F	Br	CHCl	1	1	$CH_2C\equiv CH$	CH_2Br
F	Br	CHCl	1	2	H	CH_2Cl
F	Br	CHCl	1	2	H	CH_2Br
F	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	2	CO_2CH_3	CH_2Br
F	Br	CHCl	1	2	$CH_2C\equiv CH$	CH_2Cl
F	Br	CHCl	1	2	$CH_2C\equiv CH$	CH_2Br
F	CN	CH_2	1	1	H	CH_2Cl
F	CN	CH_2	1	1	H	CH_2Br
F	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	1	CO_2CH_3	CH_2Br
F	CN	CH_2	1	1	$CH_2C\equiv CH$	CH_2Cl
F	CN	CH_2	1	1	$CH_2C\equiv CH$	CH_2Br
F	CN	CH_2	1	2	H	CH_2Cl
F	CN	CH_2	1	2	H	CH_2Br
F	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Cl

F	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	2	CO_2CH_3	CH_2Br
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHF	1	1	H	CH_2Cl
F	CN	CHF	1	1	H	CH_2Br
F	CN	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CHF	1	1	CO_2CH_3	CH_2Cl
F	CN	CHF	1	1	CO_2CH_3	CH_2Br
F	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHF	1	2	H	CH_2Cl
F	CN	CHF	1	2	H	CH_2Br
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CHF	1	2	CO_2CH_3	CH_2Cl
F	CN	CHF	1	2	CO_2CH_3	CH_2Br
F	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHCl	1	1	H	CH_2Cl
F	CN	CHCl	1	1	H	CH_2Br
F	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	1	CO_2CH_3	CH_2Br
F	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHCl	1	2	H	CH_2Cl
F	CN	CHCl	1	2	H	CH_2Br
F	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CHCl	1	2	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	2	CO_2CH_3	CH_2Br
F	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CH_2	1	1	H	CH_2Cl

Cl	H	CH_2	1	1	H	CH_2Br
Cl	H	CH_2	1	2	H	CH_2Cl
Cl	H	CH_2	1	2	H	CH_2Br
Cl	H	CHF	1	1	H	CH_2Cl
Cl	H	CHF	1	1	H	CH_2Br
Cl	H	CHF	1	2	H	CH_2Cl
Cl	H	CHF	1	2	H	CH_2Br
Cl	H	CHCl	1	1	H	CH_2Cl
Cl	H	CHCl	1	1	H	CH_2Br
Cl	H	CHCl	1	2	H	CH_2Cl
Cl	H	CHCl	1	2	H	CH_2Br
Cl	Cl	CH_2	1	1	H	CH_2Cl
Cl	Cl	CH_2	1	1	H	CH_2Br
Cl	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CH_2	1	2	H	CH_2Cl
Cl	Cl	CH_2	1	2	H	CH_2Br
Cl	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	1	H	CH_2Cl
Cl	Cl	CHF	1	1	H	CH_2Br
Cl	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	2	H	CH_2Cl
Cl	Cl	CHF	1	2	H	CH_2Br
Cl	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Cl

Cl	Cl	CHF	1	2	C(=O)CH_3	CH_2Br
Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	1	H	CH_2Cl
Cl	Cl	CHCl	1	1	H	CH_2Br
Cl	Cl	CHCl	1	1	C(=O)CH_3	CH_2Cl
Cl	Cl	CHCl	1	1	C(=O)CH_3	CH_2Br
Cl	Cl	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	2	H	CH_2Cl
Cl	Cl	CHCl	1	2	H	CH_2Br
Cl	Cl	CHCl	1	2	C(=O)CH_3	CH_2Cl
Cl	Cl	CHCl	1	2	C(=O)CH_3	CH_2Br
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	1	H	CH_2Cl
Cl	Br	CH_2	1	1	H	CH_2Br
Cl	Br	CH_2	1	1	C(=O)CH_3	CH_2Cl
Cl	Br	CH_2	1	1	C(=O)CH_3	CH_2Br
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	2	H	CH_2Cl
Cl	Br	CH_2	1	2	H	CH_2Br
Cl	Br	CH_2	1	2	C(=O)CH_3	CH_2Cl
Cl	Br	CH_2	1	2	C(=O)CH_3	CH_2Br
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	1	H	CH_2Cl

Cl	Br	CHF	1	1	H	CH_2Br
Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	2	H	CH_2Cl
Cl	Br	CHF	1	2	H	CH_2Br
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHCl	1	1	H	CH_2Cl
Cl	Br	CHCl	1	1	H	CH_2Br
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHCl	1	2	H	CH_2Cl
Cl	Br	CHCl	1	2	H	CH_2Br
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CH_2	1	1	H	CH_2Cl
Cl	CN	CH_2	1	1	H	CH_2Br
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl

Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CH_2	1	2	H	CH_2Cl
Cl	CN	CH_2	1	2	H	CH_2Br
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHF	1	1	H	CH_2Cl
Cl	CN	CHF	1	1	H	CH_2Br
Cl	CN	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Br
Cl	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHF	1	2	H	CH_2Cl
Cl	CN	CHF	1	2	H	CH_2Br
Cl	CN	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Br
Cl	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHCl	1	1	H	CH_2Cl
Cl	CN	CHCl	1	1	H	CH_2Br
Cl	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHCl	1	2	H	CH_2Cl
Cl	CN	CHCl	1	2	H	CH_2Br
Cl	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Cl

Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br

J = 12, Y = Cl, and $R^2 = CH_2Cl$

X	R^1	Z	n	m	R^{22}
F	H	CH_2	1	1	CH_3
F	$C(=O)CH_3$	CH_2	1	1	CH_3
F	CO_2CH_3	CH_2	1	1	CH_3
F	H	CHF	1	1	CH_3
F	$C(=O)CH_3$	CHF	1	1	CH_3
F	CO_2CH_3	CHF	1	1	CH_3
F	H	CH_2	1	2	CH_3
F	$C(=O)CH_3$	CH_2	1	2	CH_3
F	CO_2CH_3	CH_2	1	2	CH_3
F	H	CHF	1	2	CH_3
F	$C(=O)CH_3$	CHF	1	2	CH_3
F	CO_2CH_3	CHF	1	2	CH_3
Cl	H	CH_2	1	1	CH_3
Cl	$C(=O)CH_3$	CH_2	1	1	CH_3
Cl	CO_2CH_3	CH_2	1	1	CH_3
Cl	H	CHF	1	1	CH_3
Cl	$C(=O)CH_3$	CHF	1	1	CH_3
Cl	CO_2CH_3	CHF	1	1	CH_3
Cl	H	CH_2	1	2	CH_3
Cl	$C(=O)CH_3$	CH_2	1	2	CH_3
Cl	CO_2CH_3	CH_2	1	2	CH_3
Cl	H	CHF	1	2	CH_3
Cl	$C(=O)CH_3$	CHF	1	2	CH_3
Cl	CO_2CH_3	CHF	1	2	CH_3
F	H	CH_2	1	1	CH_2CH_3
F	$C(=O)CH_3$	CH_2	1	1	CH_2CH_3
F	CO_2CH_3	CH_2	1	1	CH_2CH_3
F	H	CHF	1	1	CH_2CH_3
F	$C(=O)CH_3$	CHF	1	1	CH_2CH_3
F	CO_2CH_3	CHF	1	1	CH_2CH_3
F	H	CH_2	1	2	CH_2CH_3
F	$C(=O)CH_3$	CH_2	1	2	CH_2CH_3

F	CO_2CH_3	CH_2	1	2	CH_2CH_3
F	H	CHF	1	2	CH_2CH_3
F	C(=O)CH_3	CHF	1	2	CH_2CH_3
F	CO_2CH_3	CHF	1	2	CH_2CH_3
Cl	H	CH_2	1	1	CH_2CH_3
Cl	C(=O)CH_3	CH_2	1	1	CH_2CH_3
Cl	CO_2CH_3	CH_2	1	1	CH_2CH_3
Cl	H	CHF	1	1	CH_2CH_3
Cl	C(=O)CH_3	CHF	1	1	CH_2CH_3
Cl	CO_2CH_3	CHF	1	1	CH_2CH_3
Cl	H	CH_2	1	2	CH_2CH_3
Cl	C(=O)CH_3	CH_2	1	2	CH_2CH_3
Cl	CO_2CH_3	CH_2	1	2	CH_2CH_3
Cl	H	CHF	1	2	CH_2CH_3
Cl	C(=O)CH_3	CHF	1	2	CH_2CH_3
Cl	CO_2CH_3	CHF	1	2	CH_2CH_3

J = 13, Y = Cl, and R^2 = CH_2Cl

X	R^1	Z^1	n	m	R^{21}
F	H	CH_2	1	1	Cl
F	C(=O)CH_3	CH_2	1	1	Cl
F	CO_2CH_3	CH_2	1	1	Cl
F	H	CHF	1	1	Cl
F	C(=O)CH_3	CHF	1	1	Cl
F	CO_2CH_3	CHF	1	1	Cl
F	H	CH_2	1	2	Cl
F	C(=O)CH_3	CH_2	1	2	Cl
F	CO_2CH_3	CH_2	1	2	Cl
F	H	CHF	1	2	Cl
F	C(=O)CH_3	CHF	1	2	Cl
F	CO_2CH_3	CHF	1	2	Cl
Cl	H	CH_2	1	1	Cl
Cl	C(=O)CH_3	CH_2	1	1	Cl
Cl	CO_2CH_3	CH_2	1	1	Cl
Cl	H	CHF	1	1	Cl
Cl	C(=O)CH_3	CHF	1	1	Cl
Cl	CO_2CH_3	CHF	1	1	Cl
Cl	H	CH_2	1	2	Cl

Cl	C(=O)CH_3	CH_2	1	2	Cl
Cl	CO_2CH_3	CH_2	1	2	Cl
Cl	H	CHF	1	2	Cl
Cl	C(=O)CH_3	CHF	1	2	Cl
Cl	CO_2CH_3	CHF	1	2	Cl
F	H	CH_2	1	1	Br
F	C(=O)CH_3	CH_2	1	1	Br
F	CO_2CH_3	CH_2	1	1	Br
F	H	CHF	1	1	Br
F	C(=O)CH_3	CHF	1	1	Br
F	CO_2CH_3	CHF	1	1	Br
F	H	CH_2	1	2	Br
F	C(=O)CH_3	CH_2	1	2	Br
F	CO_2CH_3	CH_2	1	2	Br
F	H	CHF	1	2	Br
F	C(=O)CH_3	CHF	1	2	Br
F	CO_2CH_3	CHF	1	2	Br
Cl	H	CH_2	1	1	Br
Cl	C(=O)CH_3	CH_2	1	1	Br
Cl	CO_2CH_3	CH_2	1	1	Br
Cl	H	CHF	1	1	Br
Cl	C(=O)CH_3	CHF	1	1	Br
Cl	CO_2CH_3	CHF	1	1	Br
Cl	H	CH_2	1	2	Br
Cl	C(=O)CH_3	CH_2	1	2	Br
Cl	CO_2CH_3	CH_2	1	2	Br
Cl	H	CHF	1	2	Br
Cl	C(=O)CH_3	CHF	1	2	Br
Cl	CO_2CH_3	CHF	1	2	Br

J = 14, Y = Cl, $R^2 = CH_2Cl$, and $R^{17} = R^{18} = CH_3$

X	R^1
F	H
F	C(=O)CH_3
F	CO_2CH_3
Cl	H
Cl	C(=O)CH_3
Cl	CO_2CH_3

$J = 15$, $Y = Cl$, $R^2 = CH_2Cl$, and $R^{19} = CH_3$

X	R^1	R^{18}
F	H	CH_3
F	$C(=O)CH_3$	CH_3
F	CO_2CH_3	CH_3
F	H	CF_3
F	$C(=O)CH_3$	CF_3
F	CO_2CH_3	CF_3
Cl	H	CH_3
Cl	$C(=O)CH_3$	CH_3
Cl	CO_2CH_3	CH_3
Cl	H	CF_3
Cl	$C(=O)CH_3$	CF_3
Cl	CO_2CH_3	CF_3

$J = 16$, $Y = Cl$, and $R^2 = CH_2Cl$

X	R^1	R^{17}
F	H	CH_3
F	$C(=O)CH_3$	CH_3
F	CO_2CH_3	CH_3
F	H	CF_3
F	$C(=O)CH_3$	CF_3
F	CO_2CH_3	CF_3
Cl	H	CH_3
Cl	$C(=O)CH_3$	CH_3
Cl	CO_2CH_3	CH_3
Cl	H	CF_3
Cl	$C(=O)CH_3$	CF_3
Cl	CO_2CH_3	CF_3

$J = 17$, $Q = O$, and $R^{19} = CH_3$

X	Y	W	R^1	R^2	R^{14}
F	H	N	H	CH_2Cl	CH_3
F	H	N	H	CH_2Br	CH_3
F	H	N	H	CH_2Cl	CF_3
F	H	N	H	CH_2Br	CF_3

F	H	N	H	CH_2Cl	$N(CH_3)_2$
F	H	N	H	CH_2Br	$N(CH_3)_2$
F	H	CCH_3	H	CH_2Cl	CH_3
F	H	CCH_3	H	CH_2Br	CH_3
F	H	CCH_3	H	CH_2Cl	CF_3
F	H	CCH_3	H	CH_2Br	CF_3
F	H	CCH_3	H	CH_2Cl	$N(CH_3)_2$
F	H	CCH_3	H	CH_2Br	$N(CH_3)_2$
F	Cl	N	H	CH_2Cl	CH_3
F	Cl	N	H	CH_2Br	CH_3
F	Cl	N	$C(=O)CH_3$	CH_2Cl	CH_3
F	Cl	N	$C(=O)CH_3$	CH_2Br	CH_3
F	Cl	N	CO_2CH_3	CH_2Cl	CH_3
F	Cl	N	CO_2CH_3	CH_2Br	CH_3
F	Cl	N	$CH_2C{\equiv}CH$	CH_2Cl	CH_3
F	Cl	N	$CH_2C{\equiv}CH$	CH_2Br	CH_3
F	Cl	N	H	CH_2Cl	CF_3
F	Cl	N	H	CH_2Br	CF_3
F	Cl	N	$C(=O)CH_3$	CH_2Cl	CF_3
F	Cl	N	$C(=O)CH_3$	CH_2Br	CF_3
F	Cl	N	CO_2CH_3	CH_2Cl	CF_3
F	Cl	N	CO_2CH_3	CH_2Br	CF_3
F	Cl	N	$CH_2C{\equiv}CH$	CH_2Cl	CF_3
F	Cl	N	$CH_2C{\equiv}CH$	CH_2Br	CF_3
F	Cl	N	H	CH_2Cl	$N(CH_3)_2$
F	Cl	N	H	CH_2Br	$N(CH_3)_2$
F	Cl	N	$C(=O)CH_3$	CH_2Cl	$N(CH_3)_2$
F	Cl	N	$C(=O)CH_3$	CH_2Br	$N(CH_3)_2$
F	Cl	N	CO_2CH_3	CH_2Cl	$N(CH_3)_2$
F	Cl	N	CO_2CH_3	CH_2Br	$N(CH_3)_2$
F	Cl	N	$CH_2C{\equiv}CH$	CH_2Cl	$N(CH_3)_2$
F	Cl	N	$CH_2C{\equiv}CH$	CH_2Br	$N(CH_3)_2$
F	Cl	CCH_3	H	CH_2Cl	CH_3
F	Cl	CCH_3	H	CH_2Br	CH_3
F	Cl	CCH_3	$C(=O)CH_3$	CH_2Cl	CH_3
F	Cl	CCH_3	$C(=O)CH_3$	CH_2Br	CH_3
F	Cl	CCH_3	CO_2CH_3	CH_2Cl	CH_3
F	Cl	CCH_3	CO_2CH_3	CH_2Br	CH_3

F	Cl	CCH3	$CH_2C\equiv CH$	CH_2Cl	CH_3
F	Cl	CCH3	$CH_2C\equiv CH$	CH_2Br	CH_3
F	Cl	CCH_3	H	CH_2Cl	CF_3
F	Cl	CCH_3	H	CH_2Br	CF_3
F	Cl	CCH_3	$C(=O)CH_3$	CH_2Cl	CF_3
F	Cl	CCH_3	$C(=O)CH_3$	CH_2Br	CF_3
F	Cl	CCH_3	CO_2CH_3	CH_2Cl	CF_3
F	Cl	CCH_3	CO_2CH_3	CH_2Br	CF_3
F	Cl	CCH_3	$CH_2C\equiv CH$	CH_2Cl	CF_3
F	Cl	CCH_3	$CH_2C\equiv CH$	CH_2Br	CF_3
F	Cl	CCH_3	H	CH_2Cl	$N(CH_3)_2$
F	Cl	CCH_3	H	CH_2Br	$N(CH_3)_2$
F	Cl	CCH_3	$C(=O)CH_3$	CH_2Cl	$N(CH_3)_2$
F	Cl	CCH_3	$C(=O)CH_3$	CH_2Br	$N(CH_3)_2$
F	Cl	CCH_3	CO_2CH_3	CH_2Cl	$N(CH_3)_2$
F	Cl	CCH_3	CO_2CH_3	CH_2Br	$N(CH_3)_2$
F	Cl	CCH_3	$CH_2C\equiv CH$	CH_2Cl	$N(CH_3)_2$
F	Cl	CCH_3	$CH_2C\equiv CH$	CH_2Br	$N(CH_3)_2$
F	Br	N	H	CH_2Cl	CH_3
F	Br	N	H	CH_2Br	CH_3
F	Br	N	$C(=O)CH_3$	CH_2Cl	CH_3
F	Br	N	$C(=O)CH_3$	CH_2Br	CH_3
F	Br	N	CO_2CH_3	CH_2Cl	CH_3
F	Br	N	CO_2CH_3	CH_2Br	CH_3
F	Br	N	$CH_2C\equiv CH$	CH_2Cl	CH_3
F	Br	N	$CH_2C\equiv CH$	CH_2Br	CH_3
F	Br	N	H	CH_2Cl	CF_3
F	Br	N	H	CH_2Br	CF_3
F	Br	N	$C(=O)CH_3$	CH_2Cl	CF_3
F	Br	N	$C(=O)CH_3$	CH_2Br	CF_3
F	Br	N	CO_2CH_3	CH_2Cl	CF_3
F	Br	N	CO_2CH_3	CH_2Br	CF_3
F	Br	N	$CH_2C\equiv CH$	CH_2Cl	CF_3
F	Br	N	$CH_2C\equiv CH$	CH_2Br	CF_3
F	Br	N	H	CH_2Cl	$N(CH_3)_2$
F	Br	N	H	CH_2Br	$N(CH_3)_2$
F	Br	N	$C(=O)CH_3$	CH_2Cl	$N(CH_3)_2$
F	Br	N	$C(=O)CH_3$	CH_2Br	$N(CH_3)_2$

F	Br	N	CO_2CH_3	CH_2Cl	$N(CH_3)_2$
F	Br	N	CO_2CH_3	CH_2Br	$N(CH_3)_2$
F	Br	N	$CH_2C{\equiv}CH$	CH_2Cl	$N(CH_3)_2$
F	Br	N	$CH_2C{\equiv}CH$	CH_2Br	$N(CH_3)_2$
F	Br	CCH_3	H	CH_2Cl	CH_3
F	Br	CCH_3	H	CH_2Br	CH_3
F	Br	CCH_3	$C(=O)CH_3$	CH_2Cl	CH_3
F	Br	CCH_3	$C(=O)CH_3$	CH_2Br	CH_3
F	Br	CCH_3	CO_2CH_3	CH_2Cl	CH_3
F	Br	CCH_3	CO_2CH_3	CH_2Br	CH_3
F	Br	CCH_3	$CH_2C{\equiv}CH$	CH_2Cl	CH_3
F	Br	CCH_3	$CH_2C{\equiv}CH$	CH_2Br	CH_3
F	Br	CCH_3	H	CH_2Cl	CF_3
F	Br	CCH_3	H	CH_2Br	CF_3
F	Br	CCH_3	$C(=O)CH_3$	CH_2Cl	CF_3
F	Br	CCH_3	$C(=O)CH_3$	CH_2Br	CF_3
F	Br	CCH_3	CO_2CH_3	CH_2Cl	CF_3
F	Br	CCH_3	CO_2CH_3	CH_2Br	CF_3
F	Br	CCH_3	$CH_2C{\equiv}CH$	CH_2Cl	CF_3
F	Br	CCH_3	$CH_2C{\equiv}CH$	CH_2Br	CF_3
F	Br	CCH_3	H	CH_2Cl	$N(CH_3)_2$
F	Br	CCH_3	H	CH_2Br	$N(CH_3)_2$
F	Br	CCH_3	$C(=O)CH_3$	CH_2Cl	$N(CH_3)_2$
F	Br	CCH_3	$C(=O)CH_3$	CH_2Br	$N(CH_3)_2$
F	Br	CCH_3	CO_2CH_3	CH_2Cl	$N(CH_3)_2$
F	Br	CCH_3	CO_2CH_3	CH_2Br	$N(CH_3)_2$
F	Br	CCH_3	$CH_2C{\equiv}CH$	CH_2Cl	$N(CH_3)_2$
F	Br	CCH_3	$CH_2C{\equiv}CH$	CH_2Br	$N(CH_3)_2$
F	CN	N	H	CH_2Cl	CH_3
F	CN	N	H	CH_2Br	CH_3
F	CN	N	$C(=O)CH_3$	CH_2Cl	CH_3
F	CN	N	$C(=O)CH_3$	CH_2Br	CH_3
F	CN	N	CO_2CH_3	CH_2Cl	CH_3
F	CN	N	CO_2CH_3	CH_2Br	CH_3
F	CN	N	$CH_2C{\equiv}CH$	CH_2Cl	CH_3
F	CN	N	$CH_2C{\equiv}CH$	CH_2Br	CH_3
F	CN	N	H	CH_2Cl	CF_3
F	CN	N	H	CH_2Br	CF_3

F	CN	N	$C(=O)CH_3$	CH_2Cl	CF_3
F	CN	N	$C(=O)CH_3$	CH_2Br	CF_3
F	CN	N	CO_2CH_3	CH_2Cl	CF_3
F	CN	N	CO_2CH_3	CH_2Br	CF_3
F	CN	N	$CH_2C{\equiv}CH$	CH_2Cl	CF_3
F	CN	N	$CH_2C{\equiv}CH$	CH_2Br	CF_3
F	CN	N	H	CH_2Cl	$N(CH_3)_2$
F	CN	N	H	CH_2Br	$N(CH_3)_2$
F	CN	N	$C(=O)CH_3$	CH_2Cl	$N(CH_3)_2$
F	CN	N	$C(=O)CH_3$	CH_2Br	$N(CH_3)_2$
F	CN	N	CO_2CH_3	CH_2Cl	$N(CH_3)_2$
F	CN	N	CO_2CH_3	CH_2Br	$N(CH_3)_2$
F	CN	N	$CH_2C{\equiv}CH$	CH_2Cl	$N(CH_3)_2$
F	CN	N	$CH_2C{\equiv}CH$	CH_2Br	$N(CH_3)_2$
F	CN	CCH_3	H	CH_2Cl	CH_3
F	CN	CCH_3	H	CH_2Br	CH_3
F	CN	CCH_3	$C(=O)CH_3$	CH_2Cl	CH_3
F	CN	CCH_3	$C(=O)CH_3$	CH_2Br	CH_3
F	CN	CCH_3	CO_2CH_3	CH_2Cl	CH_3
F	CN	CCH_3	CO_2CH_3	CH_2Br	CH_3
F	CN	CCH_3	$CH_2C{\equiv}CH$	CH_2Cl	CH_3
F	CN	CCH_3	$CH_2C{\equiv}CH$	CH_2Br	CH_3
F	CN	CCH_3	H	CH_2Cl	CF_3
F	CN	CCH_3	H	CH_2Br	CF_3
F	CN	CCH_3	$C(=O)CH_3$	CH_2Cl	CF_3
F	CN	CCH_3	$C(=O)CH_3$	CH_2Br	CF_3
F	CN	CCH_3	CO_2CH_3	CH_2Cl	CF_3
F	CN	CCH_3	CO_2CH_3	CH_2Br	CF_3
F	CN	CCH_3	$CH_2C{\equiv}CH$	CH_2Cl	CF_3
F	CN	CCH_3	$CH_2C{\equiv}CH$	CH_2Br	CF_3
F	CN	CCH_3	H	CH_2Cl	$N(CH_3)_2$
F	CN	CCH_3	H	CH_2Br	$N(CH_3)_2$
F	CN	CCH_3	$C(=O)CH_3$	CH_2Cl	$N(CH_3)_2$
F	CN	CCH_3	$C(=O)CH_3$	CH_2Br	$N(CH_3)_2$
F	CN	CCH_3	CO_2CH_3	CH_2Cl	$N(CH_3)_2$
F	CN	CCH_3	CO_2CH_3	CH_2Br	$N(CH_3)_2$
F	CN	CCH_3	$CH_2C{\equiv}CH$	CH_2Cl	$N(CH_3)_2$
F	CN	CCH_3	$CH_2C{\equiv}CH$	CH_2Br	$N(CH_3)_2$

Cl	H	N	H	CH_2Cl	CH_3
Cl	H	N	H	CH_2Br	CH_3
Cl	H	N	H	CH_2Cl	CF_3
Cl	H	N	H	CH_2Br	CF_3
Cl	H	N	H	CH_2Cl	$N(CH_3)_2$
Cl	H	N	H	CH_2Br	$N(CH_3)_2$
Cl	H	CCH_3	H	CH_2Cl	CH_3
Cl	H	CCH_3	H	CH_2Br	CH_3
Cl	H	CCH_3	H	CH_2Cl	CF_3
Cl	H	CCH_3	H	CH_2Br	CF_3
Cl	H	CCH_3	H	CH_2Cl	$N(CH_3)_2$
Cl	H	CCH_3	H	CH_2Br	$N(CH_3)_2$
Cl	Cl	N	H	CH_2Cl	CH_3
Cl	Cl	N	H	CH_2Br	CH_3
Cl	Cl	N	$C(=O)CH_3$	CH_2Cl	CH_3
Cl	Cl	N	$C(=O)CH_3$	CH_2Br	CH_3
Cl	Cl	N	CO_2CH_3	CH_2Cl	CH_3
Cl	Cl	N	CO_2CH_3	CH_2Br	CH_3
Cl	Cl	N	$CH_2C{\equiv}CH$	CH_2Cl	CH_3
Cl	Cl	N	$CH_2C{\equiv}CH$	CH_2Br	CH_3
Cl	Cl	N	H	CH_2Cl	CF_3
Cl	Cl	N	H	CH_2Br	CF_3
Cl	Cl	N	$C(=O)CH_3$	CH_2Cl	CF_3
Cl	Cl	N	$C(=O)CH_3$	CH_2Br	CF_3
Cl	Cl	N	CO_2CH_3	CH_2Cl	CF_3
Cl	Cl	N	CO_2CH_3	CH_2Br	CF_3
Cl	Cl	N	$CH_2C{\equiv}CH$	CH_2Cl	CF_3
Cl	Cl	N	$CH_2C{\equiv}CH$	CH_2Br	CF_3
Cl	Cl	N	H	CH_2Cl	$N(CH_3)_2$
Cl	Cl	N	H	CH_2Br	$N(CH_3)_2$
Cl	Cl	N	$C(=O)CH_3$	CH_2Cl	$N(CH_3)_2$
Cl	Cl	N	$C(=O)CH_3$	CH_2Br	$N(CH_3)_2$
Cl	Cl	N	CO_2CH_3	CH_2Cl	$N(CH_3)_2$
Cl	Cl	N	CO_2CH_3	CH_2Br	$N(CH_3)_2$
Cl	Cl	N	$CH_2C{\equiv}CH$	CH_2Cl	$N(CH_3)_2$
Cl	Cl	N	$CH_2C{\equiv}CH$	CH_2Br	$N(CH_3)_2$
Cl	Cl	CCH_3	H	CH_2Cl	CH_3
Cl	Cl	CCH_3	H	CH_2Br	CH_3

Cl	Cl	CCH_3	$C(=O)CH_3$	CH_2Cl	CH_3
Cl	Cl	CCH_3	$C(=O)CH_3$	CH_2Br	CH_3
Cl	Cl	CCH_3	CO_2CH_3	CH_2Cl	CH_3
Cl	Cl	CCH_3	CO_2CH_3	CH_2Br	CH_3
Cl	Cl	CCH_3	$CH_2C{\equiv}CH$	CH_2Cl	CH_3
Cl	Cl	CCH_3	$CH_2C{\equiv}CH$	CH_2Br	CH_3
Cl	Cl	CCH_3	H	CH_2Cl	CF_3
Cl	Cl	CCH_3	H	CH_2Br	CF_3
Cl	Cl	CCH_3	$C(=O)CH_3$	CH_2Cl	CF_3
Cl	Cl	CCH_3	$C(=O)CH_3$	CH_2Br	CF_3
Cl	Cl	CCH_3	CO_2CH_3	CH_2Cl	CF_3
Cl	Cl	CCH_3	CO_2CH_3	CH_2Br	CF_3
Cl	Cl	CCH_3	$CH_2C{\equiv}CH$	CH_2Cl	CF_3
Cl	Cl	CCH_3	$CH_2C{\equiv}CH$	CH_2Br	CF_3
Cl	Cl	CCH_3	H	CH_2Cl	$N(CH_3)_2$
Cl	Cl	CCH_3	H	CH_2Br	$N(CH_3)_2$
Cl	Cl	CCH_3	$C(=O)CH_3$	CH_2Cl	$N(CH_3)_2$
Cl	Cl	CCH_3	$C(=O)CH_3$	CH_2Br	$N(CH_3)_2$
Cl	Cl	CCH_3	CO_2CH_3	CH_2Cl	$N(CH_3)_2$
Cl	Cl	CCH_3	CO_2CH_3	CH_2Br	$N(CH_3)_2$
Cl	Cl	CCH_3	$CH_2C{\equiv}CH$	CH_2Cl	$N(CH_3)_2$
Cl	Cl	CCH_3	$CH_2C{\equiv}CH$	CH_2Br	$N(CH_3)_2$
Cl	Br	N	H	CH_2Cl	CH_3
Cl	Br	N	H	CH_2Br	CH_3
Cl	Br	N	$C(=O)CH_3$	CH_2Cl	CH_3
Cl	Br	N	$C(=O)CH_3$	CH_2Br	CH_3
Cl	Br	N	CO_2CH_3	CH_2Cl	CH_3
Cl	Br	N	CO_2CH_3	CH_2Br	CH_3
Cl	Br	N	$CH_2C{\equiv}CH$	CH_2Cl	CH_3
Cl	Br	N	$CH_2C{\equiv}CH$	CH_2Br	CH_3
Cl	Br	N	H	CH_2Cl	CF_3
Cl	Br	N	H	CH_2Br	CF_3
Cl	Br	N	$C(=O)CH_3$	CH_2Cl	CF_3
Cl	Br	N	$C(=O)CH_3$	CH_2Br	CF_3
Cl	Br	N	CO_2CH_3	CH_2Cl	CF_3
Cl	Br	N	CO_2CH_3	CH_2Br	CF_3
Cl	Br	N	$CH_2C{\equiv}CH$	CH_2Cl	CF_3
Cl	Br	N	$CH_2C{\equiv}CH$	CH_2Br	CF_3

Cl	Br	N	H	CH_2Cl	$N(CH_3)_2$
Cl	Br	N	H	CH_2Br	$N(CH_3)_2$
Cl	Br	N	$C(=O)CH_3$	CH_2Cl	$N(CH_3)_2$
Cl	Br	N	$C(=O)CH_3$	CH_2Br	$N(CH_3)_2$
Cl	Br	N	CO_2CH_3	CH_2Cl	$N(CH_3)_2$
Cl	Br	N	CO_2CH_3	CH_2Br	$N(CH_3)_2$
Cl	Br	N	$CH_2C{\equiv}CH$	CH_2Cl	$N(CH_3)_2$
Cl	Br	N	$CH_2C{\equiv}CH$	CH_2Br	$N(CH_3)_2$
Cl	Br	CCH_3	H	CH_2Cl	CH_3
Cl	Br	CCH_3	H	CH_2Br	CH_3
Cl	Br	CCH_3	$C(=O)CH_3$	CH_2Cl	CH_3
Cl	Br	CCH_3	$C(=O)CH_3$	CH_2Br	CH_3
Cl	Br	CCH_3	CO_2CH_3	CH_2Cl	CH_3
Cl	Br	CCH_3	CO_2CH_3	CH_2Br	CH_3
Cl	Br	CCH_3	$CH_2C{\equiv}CH$	CH_2Cl	CH_3
Cl	Br	CCH_3	$CH_2C{\equiv}CH$	CH_2Br	CH_3
Cl	Br	CCH_3	H	CH_2Cl	CF_3
Cl	Br	CCH_3	H	CH_2Br	CF_3
Cl	Br	CCH_3	$C(=O)CH_3$	CH_2Cl	CF_3
Cl	Br	CCH_3	$C(=O)CH_3$	CH_2Br	CF_3
Cl	Br	CCH_3	CO_2CH_3	CH_2Cl	CF_3
Cl	Br	CCH_3	CO_2CH_3	CH_2Br	CF_3
Cl	Br	CCH_3	$CH_2C{\equiv}CH$	CH_2Cl	CF_3
Cl	Br	CCH_3	$CH_2C{\equiv}CH$	CH_2Br	CF_3
Cl	Br	CCH_3	H	CH_2Cl	$N(CH_3)_2$
Cl	Br	CCH_3	H	CH_2Br	$N(CH_3)_2$
Cl	Br	CCH_3	$C(=O)CH_3$	CH_2Cl	$N(CH_3)_2$
Cl	Br	CCH_3	$C(=O)CH_3$	CH_2Br	$N(CH_3)_2$
Cl	Br	CCH_3	CO_2CH_3	CH_2Cl	$N(CH_3)_2$
Cl	Br	CCH_3	CO_2CH_3	CH_2Br	$N(CH_3)_2$
Cl	Br	CCH_3	$CH_2C{\equiv}CH$	CH_2Cl	$N(CH_3)_2$
Cl	Br	CCH_3	$CH_2C{\equiv}CH$	CH_2Br	$N(CH_3)_2$
Cl	CN	N	H	CH_2Cl	CH_3
Cl	CN	N	H	CH_2Br	CH_3
Cl	CN	N	$C(=O)CH_3$	CH_2Cl	CH_3
Cl	CN	N	$C(=O)CH_3$	CH_2Br	CH_3
Cl	CN	N	CO_2CH_3	CH_2Cl	CH_3
Cl	CN	N	CO_2CH_3	CH_2Br	CH_3

Cl	CN	N	$CH_2C{\equiv}CH$	CH_2Cl	CH_3
Cl	CN	N	$CH_2C{\equiv}CH$	CH_2Br	CH_3
Cl	CN	N	H	CH_2Cl	CF_3
Cl	CN	N	H	CH_2Br	CF_3
Cl	CN	N	$C(=O)CH_3$	CH_2Cl	CF_3
Cl	CN	N	$C(=O)CH_3$	CH_2Br	CF_3
Cl	CN	N	CO_2CH_3	CH_2Cl	CF_3
Cl	CN	N	CO_2CH_3	CH_2Br	CF_3
Cl	CN	N	$CH_2C{\equiv}CH$	CH_2Cl	CF_3
Cl	CN	N	$CH_2C{\equiv}CH$	CH_2Br	CF_3
Cl	CN	N	H	CH_2Cl	$N(CH_3)_2$
Cl	CN	N	H	CH_2Br	$N(CH_3)_2$
Cl	CN	N	$C(=O)CH_3$	CH_2Cl	$N(CH_3)_2$
Cl	CN	N	$C(=O)CH_3$	CH_2Br	$N(CH_3)_2$
Cl	CN	N	CO_2CH_3	CH_2Cl	$N(CH_3)_2$
Cl	CN	N	CO_2CH_3	CH_2Br	$N(CH_3)_2$
Cl	CN	N	$CH_2C{\equiv}CH$	CH_2Cl	$N(CH_3)_2$
Cl	CN	N	$CH_2C{\equiv}CH$	CH_2Br	$N(CH_3)_2$
Cl	CN	CCH_3	H	CH_2Cl	CH_3
Cl	CN	CCH_3	H	CH_2Br	CH_3
Cl	CN	CCH_3	$C(=O)CH_3$	CH_2Cl	CH_3
Cl	CN	CCH_3	$C(=O)CH_3$	CH_2Br	CH_3
Cl	CN	CCH_3	CO_2CH_3	CH_2Cl	CH_3
Cl	CN	CCH_3	CO_2CH_3	CH_2Br	CH_3
Cl	CN	CCH_3	$CH_2C{\equiv}CH$	CH_2Cl	CH_3
Cl	CN	CCH_3	$CH_2C{\equiv}CH$	CH_2Br	CH_3
Cl	CN	CCH_3	H	CH_2Cl	CF_3
Cl	CN	CCH_3	H	CH_2Br	CF_3
Cl	CN	CCH_3	$C(=O)CH_3$	CH_2Cl	CF_3
Cl	CN	CCH_3	$C(=O)CH_3$	CH_2Br	CF_3
Cl	CN	CCH_3	CO_2CH_3	CH_2Cl	CF_3
Cl	CN	CCH_3	CO_2CH_3	CH_2Br	CF_3
Cl	CN	CCH_3	$CH_2C{\equiv}CH$	CH_2Cl	CF_3
Cl	CN	CCH_3	$CH_2C{\equiv}CH$	CH_2Br	CF_3
Cl	CN	CCH_3	H	CH_2Cl	$N(CH_3)_2$
Cl	CN	CCH_3	H	CH_2Br	$N(CH_3)_2$
Cl	CN	CCH_3	$C(=O)CH_3$	CH_2Cl	$N(CH_3)_2$
Cl	CN	CCH_3	$C(=O)CH_3$	CH_2Br	$N(CH_3)_2$

Cl	CN	CCH_3	CO_2CH_3	CH_2Cl	$N(CH_3)_2$
Cl	CN	CCH_3	CO_2CH_3	CH_2Br	$N(CH_3)_2$
Cl	CN	CCH_3	$CH_2C{\equiv}CH$	CH_2Cl	$N(CH_3)_2$
Cl	CN	CCH_3	$CH_2C{\equiv}CH$	CH_2Br	$N(CH_3)_2$

J = 18, Q = O, Y = Cl, and $R^2 = CH_2Cl$

X	R^1	Z	n	m
F	H	CH_2	1	1
F	$C(=O)CH_3$	CH_2	1	1
F	CO_2CH_3	CH_2	1	1
F	H	CHF	1	1
F	$C(=O)CH_3$	CHF	1	1
F	CO_2CH_3	CHF	1	1
F	H	CH_2	1	2
F	$C(=O)CH_3$	CH_2	1	2
F	CO_2CH_3	CH_2	1	2
F	H	CHF	1	2
F	$C(=O)CH_3$	CHF	1	2
F	CO_2CH_3	CHF	1	2
Cl	H	CH_2	1	1
Cl	$C(=O)CH_3$	CH_2	1	1
Cl	CO_2CH_3	CH_2	1	1
Cl	H	CHF	1	1
Cl	$C(=O)CH_3$	CHF	1	1
Cl	CO_2CH_3	CHF	1	1
Cl	H	CH_2	1	2
Cl	$C(=O)CH_3$	CH_2	1	2
Cl	CO_2CH_3	CH_2	1	2
Cl	H	CHF	1	2
Cl	$C(=O)CH_3$	CHF	1	2
Cl	CO_2CH_3	CHF	1	2

J = 19, Q = O, and $R^{24} = CO_2CH_3$

X	Y	Z	n	m	R^1	R^2
F	H	CH_2	1	1	H	CH_2Cl
F	H	CH_2	1	1	H	CH_2Br

F	H	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	H	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	H	CH_2	1	1	CO_2CH_3	CH_2Cl
F	H	CH_2	1	1	CO_2CH_3	CH_2Br
F	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	H	CH_2	1	2	H	CH_2Cl
F	H	CH_2	1	2	H	CH_2Br
F	H	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	H	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	H	CH_2	1	2	CO_2CH_3	CH_2Cl
F	H	CH_2	1	2	CO_2CH_3	CH_2Br
F	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	H	CHF	1	1	H	CH_2Cl
F	H	CHF	1	1	H	CH_2Br
F	H	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	H	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	H	CHF	1	1	CO_2CH_3	CH_2Cl
F	H	CHF	1	1	CO_2CH_3	CH_2Br
F	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	H	CHF	1	2	H	CH_2Cl
F	H	CHF	1	2	H	CH_2Br
F	H	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	H	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	H	CHF	1	2	CO_2CH_3	CH_2Cl
F	H	CHF	1	2	CO_2CH_3	CH_2Br
F	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	H	CHCl	1	1	H	CH_2Cl
F	H	CHCl	1	1	H	CH_2Br
F	H	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	H	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	H	CHCl	1	1	CO_2CH_3	CH_2Cl
F	H	CHCl	1	1	CO_2CH_3	CH_2Br
F	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br

F	H	CHCl	1	2	H	CH_2Cl
F	H	CHCl	1	2	H	CH_2Br
F	H	CHCl	1	2	C(=O)CH_3	CH_2Cl
F	H	CHCl	1	2	C(=O)CH_3	CH_2Br
F	H	CHCl	1	2	CO_2CH_3	CH_2Cl
F	H	CHCl	1	2	CO_2CH_3	CH_2Br
F	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CH_2	1	1	H	CH_2Cl
F	Cl	CH_2	1	1	H	CH_2Br
F	Cl	CH_2	1	1	C(=O)CH_3	CH_2Cl
F	Cl	CH_2	1	1	C(=O)CH_3	CH_2Br
F	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl
F	Cl	CH_2	1	1	CO_2CH_3	CH_2Br
F	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CH_2	1	2	H	CH_2Cl
F	Cl	CH_2	1	2	H	CH_2Br
F	Cl	CH_2	1	2	C(=O)CH_3	CH_2Cl
F	Cl	CH_2	1	2	C(=O)CH_3	CH_2Br
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Br
F	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHF	1	1	H	CH_2Cl
F	Cl	CHF	1	1	H	CH_2Br
F	Cl	CHF	1	1	C(=O)CH_3	CH_2Cl
F	Cl	CHF	1	1	C(=O)CH_3	CH_2Br
F	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	1	CO_2CH_3	CH_2Br
F	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHF	1	2	H	CH_2Cl
F	Cl	CHF	1	2	H	CH_2Br
F	Cl	CHF	1	2	C(=O)CH_3	CH_2Cl
F	Cl	CHF	1	2	C(=O)CH_3	CH_2Br
F	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	2	CO_2CH_3	CH_2Br

F	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHCl	1	1	H	CH_2Cl
F	Cl	CHCl	1	1	H	CH_2Br
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHCl	1	2	H	CH_2Cl
F	Cl	CHCl	1	2	H	CH_2Br
F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	1	H	CH_2Cl
F	Br	CH_2	1	1	H	CH_2Br
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	1	CO_2CH_3	CH_2Br
F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	2	H	CH_2Cl
F	Br	CH_2	1	2	H	CH_2Br
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	2	CO_2CH_3	CH_2Br
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHF	1	1	H	CH_2Cl
F	Br	CHF	1	1	H	CH_2Br
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br

F	Br	CHF	1	1	CO_2CH_3	CH_2Cl
F	Br	CHF	1	1	CO_2CH_3	CH_2Br
F	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHF	1	2	H	CH_2Cl
F	Br	CHF	1	2	H	CH_2Br
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CHF	1	2	CO_2CH_3	CH_2Cl
F	Br	CHF	1	2	CO_2CH_3	CH_2Br
F	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHCl	1	1	H	CH_2Cl
F	Br	CHCl	1	1	H	CH_2Br
F	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	1	CO_2CH_3	CH_2Br
F	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHCl	1	2	H	CH_2Cl
F	Br	CHCl	1	2	H	CH_2Br
F	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	2	CO_2CH_3	CH_2Br
F	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CH_2	1	1	H	CH_2Cl
F	CN	CH_2	1	1	H	CH_2Br
F	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	1	CO_2CH_3	CH_2Br
F	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CH_2	1	2	H	CH_2Cl
F	CN	CH_2	1	2	H	CH_2Br

F	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	2	CO_2CH_3	CH_2Br
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHF	1	1	H	CH_2Cl
F	CN	CHF	1	1	H	CH_2Br
F	CN	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CHF	1	1	CO_2CH_3	CH_2Cl
F	CN	CHF	1	1	CO_2CH_3	CH_2Br
F	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHF	1	2	H	CH_2Cl
F	CN	CHF	1	2	H	CH_2Br
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CHF	1	2	CO_2CH_3	CH_2Cl
F	CN	CHF	1	2	CO_2CH_3	CH_2Br
F	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHCl	1	1	H	CH_2Cl
F	CN	CHCl	1	1	H	CH_2Br
F	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	1	CO_2CH_3	CH_2Br
F	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHCl	1	2	H	CH_2Cl
F	CN	CHCl	1	2	H	CH_2Br
F	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CHCl	1	2	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	2	CO_2CH_3	CH_2Br
F	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br

Cl	H	CH_2	1	1	H	CH_2Cl
Cl	H	CH_2	1	1	H	CH_2Br
Cl	H	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	H	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	H	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	H	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CH_2	1	2	H	CH_2Cl
Cl	H	CH_2	1	2	H	CH_2Br
Cl	H	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	H	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	H	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	H	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHF	1	1	H	CH_2Cl
Cl	H	CHF	1	1	H	CH_2Br
Cl	H	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	H	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	H	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	H	CHF	1	1	CO_2CH_3	CH_2Br
Cl	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHF	1	2	H	CH_2Cl
Cl	H	CHF	1	2	H	CH_2Br
Cl	H	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	H	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	H	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	H	CHF	1	2	CO_2CH_3	CH_2Br
Cl	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHCl	1	1	H	CH_2Cl
Cl	H	CHCl	1	1	H	CH_2Br
Cl	H	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	H	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	H	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	H	CHCl	1	1	CO_2CH_3	CH_2Br

Cl	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHCl	1	2	H	CH_2Cl
Cl	H	CHCl	1	2	H	CH_2Br
Cl	H	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	H	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	H	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	H	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CH_2	1	1	H	CH_2Cl
Cl	Cl	CH_2	1	1	H	CH_2Br
Cl	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CH_2	1	2	H	CH_2Cl
Cl	Cl	CH_2	1	2	H	CH_2Br
Cl	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	1	H	CH_2Cl
Cl	Cl	CHF	1	1	H	CH_2Br
Cl	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	2	H	CH_2Cl
Cl	Cl	CHF	1	2	H	CH_2Br
Cl	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Br

Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	1	H	CH_2Cl
Cl	Cl	CHCl	1	1	H	CH_2Br
Cl	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHCl	1	1	$CO2CH_3$	CH_2Cl
Cl	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	2	H	CH_2Cl
Cl	Cl	CHCl	1	2	H	CH_2Br
Cl	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	1	H	CH_2Cl
Cl	Br	CH_2	1	1	H	CH_2Br
Cl	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	2	H	CH_2Cl
Cl	Br	CH_2	1	2	H	CH_2Br
Cl	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	1	H	CH_2Cl
Cl	Br	CHF	1	1	H	CH_2Br

Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	2	H	CH_2Cl
Cl	Br	CHF	1	2	H	CH_2Br
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHCl	1	1	H	CH_2Cl
Cl	Br	CHCl	1	1	H	CH_2Br
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHCl	1	2	H	CH_2Cl
Cl	Br	CHCl	1	2	H	CH_2Br
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CH_2	1	1	H	CH_2Cl
Cl	CN	CH_2	1	1	H	CH_2Br
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br

Cl	CN	CH_2	1	2	H	CH_2Cl
Cl	CN	CH_2	1	2	H	CH_2Br
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHF	1	1	H	CH_2Cl
Cl	CN	CHF	1	1	H	CH_2Br
Cl	CN	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Br
Cl	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHF	1	2	H	CH_2Cl
Cl	CN	CHF	1	2	H	CH_2Br
Cl	CN	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Br
Cl	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHCl	1	1	H	CH_2Cl
Cl	CN	CHCl	1	1	H	CH_2Br
Cl	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHCl	1	2	H	CH_2Cl
Cl	CN	CHCl	1	2	H	CH_2Br
Cl	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Br

Cl	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br

J = 19, Q = O, and R^{24} = $C(O)N(OCH_3)(CH_3)$

X	Y	Z	n	m	R^1	R^2
F	H	CH_2	1	1	H	CH_2Cl
F	H	CH_2	1	1	H	CH_2Br
F	H	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	H	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	H	CH_2	1	1	CO_2CH_3	CH_2Cl
F	H	CH_2	1	1	CO_2CH_3	CH_2Br
F	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	H	CH_2	1	2	H	CH_2Cl
F	H	CH_2	1	2	H	CH_2Br
F	H	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	H	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	H	CH_2	1	2	CO_2CH_3	CH_2Cl
F	H	CH_2	1	2	CO_2CH_3	CH_2Br
F	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	H	CHF	1	1	H	CH_2Cl
F	H	CHF	1	1	H	CH_2Br
F	H	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	H	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	H	CHF	1	1	CO_2CH_3	CH_2Cl
F	H	CHF	1	1	CO_2CH_3	CH_2Br
F	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	H	CHF	1	2	H	CH_2Cl
F	H	CHF	1	2	H	CH_2Br
F	H	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	H	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	H	CHF	1	2	CO_2CH_3	CH_2Cl
F	H	CHF	1	2	CO_2CH_3	CH_2Br
F	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br

F	H	CHCl	1	1	H	CH_2Cl
F	H	CHCl	1	1	H	CH_2Br
F	H	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	H	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	H	CHCl	1	1	CO_2CH_3	CH_2Cl
F	H	CHCl	1	1	CO_2CH_3	CH_2Br
F	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	H	CHCl	1	2	H	CH_2Cl
F	H	CHCl	1	2	H	CH_2Br
F	H	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	H	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	H	CHCl	1	2	CO_2CH_3	CH_2Cl
F	H	CHCl	1	2	CO_2CH_3	CH_2Br
F	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CH_2	1	1	H	CH_2Cl
F	Cl	CH_2	1	1	H	CH_2Br
F	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl
F	Cl	CH_2	1	1	CO_2CH_3	CH_2Br
F	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CH_2	1	2	H	CH_2Cl
F	Cl	CH_2	1	2	H	CH_2Br
F	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Br
F	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHF	1	1	H	CH_2Cl
F	Cl	CHF	1	1	H	CH_2Br
F	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	1	CO_2CH_3	CH_2Br

F	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHF	1	2	H	CH_2Cl
F	Cl	CHF	1	2	H	CH_2Br
F	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	2	CO_2CH_3	CH_2Br
F	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHCl	1	1	H	CH_2Cl
F	Cl	CHCl	1	1	H	CH_2Br
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHCl	1	2	H	CH_2Cl
F	Cl	CHCl	1	2	H	CH_2Br
F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	1	H	CH_2Cl
F	Br	CH_2	1	1	H	CH_2Br
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	1	CO_2CH_3	CH_2Br
F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	2	H	CH_2Cl
F	Br	CH_2	1	2	H	CH_2Br
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Br

F	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	2	CO_2CH_3	CH_2Br
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHF	1	1	H	CH_2Cl
F	Br	CHF	1	1	H	CH_2Br
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CHF	1	1	CO_2CH_3	CH_2Cl
F	Br	CHF	1	1	CO_2CH_3	CH_2Br
F	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHF	1	2	H	CH_2Cl
F	Br	CHF	1	2	H	CH_2Br
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CHF	1	2	CO_2CH_3	CH_2Cl
F	Br	CHF	1	2	CO_2CH_3	CH_2Br
F	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHCl	1	1	H	CH_2Cl
F	Br	CHCl	1	1	H	CH_2Br
F	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	1	CO_2CH_3	CH_2Br
F	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHCl	1	2	H	CH_2Cl
F	Br	CHCl	1	2	H	CH_2Br
F	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	2	CO_2CH_3	CH_2Br
F	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CH_2	1	1	H	CH_2Cl
F	CN	CH_2	1	1	H	CH_2Br

F	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	1	CO_2CH_3	CH_2Br
F	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CH_2	1	2	H	CH_2Cl
F	CN	CH_2	1	2	H	CH_2Br
F	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	2	CO_2CH_3	CH_2Br
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHF	1	1	H	CH_2Cl
F	CN	CHF	1	1	H	CH_2Br
F	CN	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CHF	1	1	CO_2CH_3	CH_2Cl
F	CN	CHF	1	1	CO_2CH_3	CH_2Br
F	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHF	1	2	H	CH_2Cl
F	CN	CHF	1	2	H	CH_2Br
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CHF	1	2	CO_2CH_3	CH_2Cl
F	CN	CHF	1	2	CO_2CH_3	CH_2Br
F	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHCl	1	1	H	CH_2Cl
F	CN	CHCl	1	1	H	CH_2Br
F	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	1	CO_2CH_3	CH_2Br
F	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br

F	CN	CHCl	1	2	H	CH_2Cl
F	CN	CHCl	1	2	H	CH_2Br
F	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CHCl	1	2	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	2	CO_2CH_3	CH_2Br
F	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CH_2	1	1	H	CH_2Cl
Cl	H	CH_2	1	1	H	CH_2Br
Cl	H	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	H	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	H	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	H	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CH_2	1	2	H	CH_2Cl
Cl	H	CH_2	1	2	H	CH_2Br
Cl	H	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	H	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	H	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	H	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHF	1	1	H	CH_2Cl
Cl	H	CHF	1	1	H	CH_2Br
Cl	H	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	H	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	H	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	H	CHF	1	1	CO_2CH_3	CH_2Br
Cl	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHF	1	2	H	CH_2Cl
Cl	H	CHF	1	2	H	CH_2Br
Cl	H	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	H	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	H	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	H	CHF	1	2	CO_2CH_3	CH_2Br

Cl	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHCl	1	1	H	CH_2Cl
Cl	H	CHCl	1	1	H	CH_2Br
Cl	H	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	H	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	H	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	H	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHCl	1	2	H	CH_2Cl
Cl	H	CHCl	1	2	H	CH_2Br
Cl	H	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	H	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	H	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	H	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CH_2	1	1	H	CH_2Cl
Cl	Cl	CH_2	1	1	H	CH_2Br
Cl	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CH_2	1	2	H	CH_2Cl
Cl	Cl	CH_2	1	2	H	CH_2Br
Cl	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	1	H	CH_2Cl
Cl	Cl	CHF	1	1	H	CH_2Br
Cl	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Br

Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	2	H	CH_2Cl
Cl	Cl	CHF	1	2	H	CH_2Br
Cl	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	1	H	CH_2Cl
Cl	Cl	CHCl	1	1	H	CH_2Br
Cl	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	2	H	CH_2Cl
Cl	Cl	CHCl	1	2	H	CH_2Br
Cl	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	1	H	CH_2Cl
Cl	Br	CH_2	1	1	H	CH_2Br
Cl	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	2	H	CH_2Cl
Cl	Br	CH_2	1	2	H	CH_2Br

Cl	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	1	H	CH_2Cl
Cl	Br	CHF	1	1	H	CH_2Br
Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	2	H	CH_2Cl
Cl	Br	CHF	1	2	H	CH_2Br
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHCl	1	1	H	CH_2Cl
Cl	Br	CHCl	1	1	H	CH_2Br
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHCl	1	2	H	CH_2Cl
Cl	Br	CHCl	1	2	H	CH_2Br
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br

Cl	CN	CH_2	1	1	H	CH_2Cl
Cl	CN	CH_2	1	1	H	CH_2Br
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CH_2	1	2	H	CH_2Cl
Cl	CN	CH_2	1	2	H	CH_2Br
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHF	1	1	H	CH_2Cl
Cl	CN	CHF	1	1	H	CH_2Br
Cl	CN	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Br
Cl	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHF	1	2	H	CH_2Cl
Cl	CN	CHF	1	2	H	CH_2Br
Cl	CN	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Br
Cl	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHCl	1	1	H	CH_2Cl
Cl	CN	CHCl	1	1	H	CH_2Br
Cl	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Br

Cl	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHCl	1	2	H	CH_2Cl
Cl	CN	CHCl	1	2	H	CH_2Br
Cl	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br

J = 19, Q = O, and R^{24} = $C(O)N(CH_3)_2$

X	Y	Z	n	m	R^1	R^2
F	H	CH_2	1	1	H	CH_2Cl
F	H	CH_2	1	1	H	CH_2Br
F	H	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	H	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	H	CH_2	1	1	CO_2CH_3	CH_2Cl
F	H	CH_2	1	1	CO_2CH_3	CH_2Br
F	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	H	CH_2	1	2	H	CH_2Cl
F	H	CH_2	1	2	H	CH_2Br
F	H	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	H	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	H	CH_2	1	2	CO_2CH_3	CH_2Cl
F	H	CH_2	1	2	CO_2CH_3	CH_2Br
F	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	H	CHF	1	1	H	CH_2Cl
F	H	CHF	1	1	H	CH_2Br
F	H	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	H	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	H	CHF	1	1	CO_2CH_3	CH_2Cl
F	H	CHF	1	1	CO_2CH_3	CH_2Br
F	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br

F	H	CHF	1	2	H	CH_2Cl
F	H	CHF	1	2	H	CH_2Br
F	H	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	H	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	H	CHF	1	2	CO_2CH_3	CH_2Cl
F	H	CHF	1	2	CO_2CH_3	CH_2Br
F	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	H	CHCl	1	1	H	CH_2Cl
F	H	CHCl	1	1	H	CH_2Br
F	H	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	H	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	H	CHCl	1	1	CO_2CH_3	CH_2Cl
F	H	CHCl	1	1	CO_2CH_3	CH_2Br
F	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	H	CHCl	1	2	H	CH_2Cl
F	H	CHCl	1	2	H	CH_2Br
F	H	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	H	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	H	CHCl	1	2	CO_2CH_3	CH_2Cl
F	H	CHCl	1	2	CO_2CH_3	CH_2Br
F	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CH_2	1	1	H	CH_2Cl
F	Cl	CH_2	1	1	H	CH_2Br
F	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl
F	Cl	CH_2	1	1	CO_2CH_3	CH_2Br
F	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CH_2	1	2	H	CH_2Cl
F	Cl	CH_2	1	2	H	CH_2Br
F	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Br

F	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHF	1	1	H	CH_2Cl
F	Cl	CHF	1	1	H	CH_2Br
F	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	1	CO_2CH_3	CH_2Br
F	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHF	1	2	H	CH_2Cl
F	Cl	CHF	1	2	H	CH_2Br
F	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	2	CO_2CH_3	CH_2Br
F	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHCl	1	1	H	CH_2Cl
F	Cl	CHCl	1	1	H	CH_2Br
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHCl	1	2	H	CH_2Cl
F	Cl	CHCl	1	2	H	CH_2Br
F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	1	H	CH_2Cl
F	Br	CH_2	1	1	H	CH_2Br
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Br

F	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	1	CO_2CH_3	CH_2Br
F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	2	H	CH_2Cl
F	Br	CH_2	1	2	H	CH_2Br
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	2	CO_2CH_3	CH_2Br
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHF	1	1	H	CH_2Cl
F	Br	CHF	1	1	H	CH_2Br
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CHF	1	1	CO_2CH_3	CH_2Cl
F	Br	CHF	1	1	CO_2CH_3	CH_2Br
F	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHF	1	2	H	CH_2Cl
F	Br	CHF	1	2	H	CH_2Br
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CHF	1	2	CO_2CH_3	CH_2Cl
F	Br	CHF	1	2	CO_2CH_3	CH_2Br
F	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHCl	1	1	H	CH_2Cl
F	Br	CHCl	1	1	H	CH_2Br
F	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	1	CO_2CH_3	CH_2Br
F	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHCl	1	2	H	CH_2Cl
F	Br	CHCl	1	2	H	CH_2Br

F	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	2	CO_2CH_3	CH_2Br
F	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CH_2	1	1	H	CH_2Cl
F	CN	CH_2	1	1	H	CH_2Br
F	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	1	CO_2CH_3	CH_2Br
F	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CH_2	1	2	H	CH_2Cl
F	CN	CH_2	1	2	H	CH_2Br
F	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	2	CO_2CH_3	CH_2Br
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHF	1	1	H	CH_2Cl
F	CN	CHF	1	1	H	CH_2Br
F	CN	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CHF	1	1	CO_2CH_3	CH_2Cl
F	CN	CHF	1	1	CO_2CH_3	CH_2Br
F	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHF	1	2	H	CH_2Cl
F	CN	CHF	1	2	H	CH_2Br
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CHF	1	2	CO_2CH_3	CH_2Cl
F	CN	CHF	1	2	CO_2CH_3	CH_2Br
F	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br

F	CN	CHCl	1	1	H	CH_2Cl
F	CN	CHCl	1	1	H	CH_2Br
F	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	1	CO_2CH_3	CH_2Br
F	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHCl	1	2	H	CH_2Cl
F	CN	CHCl	1	2	H	CH_2Br
F	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CHCl	1	2	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	2	CO_2CH_3	CH_2Br
F	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CH_2	1	1	H	CH_2Cl
Cl	H	CH_2	1	1	H	CH_2Br
Cl	H	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	H	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	H	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	H	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CH_2	1	2	H	CH_2Cl
Cl	H	CH_2	1	2	H	CH_2Br
Cl	H	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	H	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	H	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	H	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHF	1	1	H	CH_2Cl
Cl	H	CHF	1	1	H	CH_2Br
Cl	H	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	H	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	H	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	H	CHF	1	1	CO_2CH_3	CH_2Br

Cl	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHF	1	2	H	CH_2Cl
Cl	H	CHF	1	2	H	CH_2Br
Cl	H	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	H	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	H	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	H	CHF	1	2	CO_2CH_3	CH_2Br
Cl	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHCl	1	1	H	CH_2Cl
Cl	H	CHCl	1	1	H	CH_2Br
Cl	H	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	H	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	H	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	H	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHCl	1	2	H	CH_2Cl
Cl	H	CHCl	1	2	H	CH_2Br
Cl	H	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	H	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	H	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	H	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CH_2	1	1	H	CH_2Cl
Cl	Cl	CH_2	1	1	H	CH_2Br
Cl	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CH_2	1	2	H	CH_2Cl
Cl	Cl	CH_2	1	2	H	CH_2Br
Cl	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Br

Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	1	H	CH_2Cl
Cl	Cl	CHF	1	1	H	CH_2Br
Cl	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	2	H	CH_2Cl
Cl	Cl	CHF	1	2	H	CH_2Br
Cl	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	1	H	CH_2Cl
Cl	Cl	CHCl	1	1	H	CH_2Br
Cl	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	2	H	CH_2Cl
Cl	Cl	CHCl	1	2	H	CH_2Br
Cl	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	1	H	CH_2Cl
Cl	Br	CH_2	1	1	H	CH_2Br

Cl	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	2	H	CH_2Cl
Cl	Br	CH_2	1	2	H	CH_2Br
Cl	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	1	H	CH_2Cl
Cl	Br	CHF	1	1	H	CH_2Br
Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	2	H	CH_2Cl
Cl	Br	CHF	1	2	H	CH_2Br
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHCl	1	1	H	CH_2Cl
Cl	Br	CHCl	1	1	H	CH_2Br
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br

Cl	Br	CHCl	1	2	H	CH_2Cl
Cl	Br	CHCl	1	2	H	CH_2Br
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CH_2	1	1	H	CH_2Cl
Cl	CN	CH_2	1	1	H	CH_2Br
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CH_2	1	2	H	CH_2Cl
Cl	CN	CH_2	1	2	H	CH_2Br
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHF	1	1	H	CH_2Cl
Cl	CN	CHF	1	1	H	CH_2Br
Cl	CN	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Br
Cl	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHF	1	2	H	CH_2Cl
Cl	CN	CHF	1	2	H	CH_2Br
Cl	CN	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Br

Cl	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHCl	1	1	H	CH_2Cl
Cl	CN	CHCl	1	1	H	CH_2Br
Cl	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHCl	1	2	H	CH_2Cl
Cl	CN	CHCl	1	2	H	CH_2Br
Cl	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br

J = 19, Q = O, and R^{24} = CN

X	Y	Z	n	m	R^1	R^2
F	H	CH_2	1	1	H	CH_2Cl
F	H	CH_2	1	1	H	CH_2Br
F	H	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	H	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	H	CH_2	1	1	CO_2CH_3	CH_2Cl
F	H	CH_2	1	1	CO_2CH_3	CH_2Br
F	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	H	CH_2	1	2	H	CH_2Cl
F	H	CH_2	1	2	H	CH_2Br
F	H	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	H	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	H	CH_2	1	2	CO_2CH_3	CH_2Cl
F	H	CH_2	1	2	CO_2CH_3	CH_2Br
F	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br

F	H	CHF	1	1	H	CH_2Cl
F	H	CHF	1	1	H	CH_2Br
F	H	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	H	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	H	CHF	1	1	CO_2CH_3	CH_2Cl
F	H	CHF	1	1	CO_2CH_3	CH_2Br
F	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	H	CHF	1	2	H	CH_2Cl
F	H	CHF	1	2	H	CH_2Br
F	H	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	H	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	H	CHF	1	2	CO_2CH_3	CH_2Cl
F	H	CHF	1	2	CO_2CH_3	CH_2Br
F	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	H	CHCl	1	1	H	CH_2Cl
F	H	CHCl	1	1	H	CH_2Br
F	H	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	H	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	H	CHCl	1	1	CO_2CH_3	CH_2Cl
F	H	CHCl	1	1	CO_2CH_3	CH_2Br
F	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	H	CHCl	1	2	H	CH_2Cl
F	H	CHCl	1	2	H	CH_2Br
F	H	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	H	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	H	CHCl	1	2	CO_2CH_3	CH_2Cl
F	H	CHCl	1	2	CO_2CH_3	CH_2Br
F	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CH_2	1	1	H	CH_2Cl
F	Cl	CH_2	1	1	H	CH_2Br
F	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl
F	Cl	CH_2	1	1	CO_2CH_3	CH_2Br

F	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CH_2	1	2	H	CH_2Cl
F	Cl	CH_2	1	2	H	CH_2Br
F	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Cl	CH_2	1	2	CO_2CH_3	CH_2Br
F	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHF	1	1	H	CH_2Cl
F	Cl	CHF	1	1	H	CH_2Br
F	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	1	CO_2CH_3	CH_2Br
F	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHF	1	2	H	CH_2Cl
F	Cl	CHF	1	2	H	CH_2Br
F	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHF	1	2	CO_2CH_3	CH_2Br
F	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHCl	1	1	H	CH_2Cl
F	Cl	CHCl	1	1	H	CH_2Br
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Cl	CHCl	1	2	H	CH_2Cl
F	Cl	CHCl	1	2	H	CH_2Br
F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Br

F	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	1	H	CH_2Cl
F	Br	CH_2	1	1	H	CH_2Br
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	1	CO_2CH_3	CH_2Br
F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CH_2	1	2	H	CH_2Cl
F	Br	CH_2	1	2	H	CH_2Br
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
F	Br	CH_2	1	2	CO_2CH_3	CH_2Br
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHF	1	1	H	CH_2Cl
F	Br	CHF	1	1	H	CH_2Br
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CHF	1	1	CO_2CH_3	CH_2Cl
F	Br	CHF	1	1	CO_2CH_3	CH_2Br
F	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHF	1	2	H	CH_2Cl
F	Br	CHF	1	2	H	CH_2Br
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CHF	1	2	CO_2CH_3	CH_2Cl
F	Br	CHF	1	2	CO_2CH_3	CH_2Br
F	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHCl	1	1	H	CH_2Cl
F	Br	CHCl	1	1	H	CH_2Br

F	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	1	CO_2CH_3	CH_2Br
F	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	Br	CHCl	1	2	H	CH_2Cl
F	Br	CHCl	1	2	H	CH_2Br
F	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
F	Br	CHCl	1	2	CO_2CH_3	CH_2Br
F	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CH_2	1	1	H	CH_2Cl
F	CN	CH_2	1	1	H	CH_2Br
F	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	1	CO_2CH_3	CH_2Br
F	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CH_2	1	2	H	CH_2Cl
F	CN	CH_2	1	2	H	CH_2Br
F	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
F	CN	CH_2	1	2	CO_2CH_3	CH_2Br
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHF	1	1	H	CH_2Cl
F	CN	CHF	1	1	H	CH_2Br
F	CN	CHF	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CHF	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CHF	1	1	CO_2CH_3	CH_2Cl
F	CN	CHF	1	1	CO_2CH_3	CH_2Br
F	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br

F	CN	CHF	1	2	H	CH_2Cl
F	CN	CHF	1	2	H	CH_2Br
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CHF	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CHF	1	2	CO_2CH_3	CH_2Cl
F	CN	CHF	1	2	CO_2CH_3	CH_2Br
F	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHCl	1	1	H	CH_2Cl
F	CN	CHCl	1	1	H	CH_2Br
F	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
F	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Br
F	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	1	CO_2CH_3	CH_2Br
F	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
F	CN	CHCl	1	2	H	CH_2Cl
F	CN	CHCl	1	2	H	CH_2Br
F	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
F	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Br
F	CN	CHCl	1	2	CO_2CH_3	CH_2Cl
F	CN	CHCl	1	2	CO_2CH_3	CH_2Br
F	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
F	CN	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CH_2	1	1	H	CH_2Cl
Cl	H	CH_2	1	1	H	CH_2Br
Cl	H	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	H	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	H	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	H	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CH_2	1	2	H	CH_2Cl
Cl	H	CH_2	1	2	H	CH_2Br
Cl	H	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	H	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	H	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	H	CH_2	1	2	CO_2CH_3	CH_2Br

Cl	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHF	1	1	H	CH_2Cl
Cl	H	CHF	1	1	H	CH_2Br
Cl	H	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	H	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	H	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	H	CHF	1	1	CO_2CH_3	CH_2Br
Cl	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHF	1	2	H	CH_2Cl
Cl	H	CHF	1	2	H	CH_2Br
Cl	H	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	H	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	H	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	H	CHF	1	2	CO_2CH_3	CH_2Br
Cl	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHCl	1	1	H	CH_2Cl
Cl	H	CHCl	1	1	H	CH_2Br
Cl	H	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	H	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	H	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	H	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	H	CHCl	1	2	H	CH_2Cl
Cl	H	CHCl	1	2	H	CH_2Br
Cl	H	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	H	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	H	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	H	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	H	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CH_2	1	1	H	CH_2Cl
Cl	Cl	CH_2	1	1	H	CH_2Br
Cl	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CH_2	1	1	$C(=O)CH_3$	CH_2Br

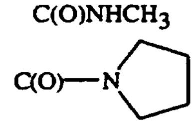
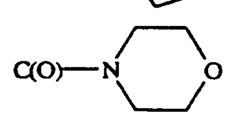
Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CH_2	1	2	H	CH_2Cl
Cl	Cl	CH_2	1	2	H	CH_2Br
Cl	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	1	H	CH_2Cl
Cl	Cl	CHF	1	1	H	CH_2Br
Cl	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHF	1	2	H	CH_2Cl
Cl	Cl	CHF	1	2	H	CH_2Br
Cl	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	1	H	CH_2Cl
Cl	Cl	CHCl	1	1	H	CH_2Br
Cl	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	Cl	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Cl	CHCl	1	2	H	CH_2Cl
Cl	Cl	CHCl	1	2	H	CH_2Br

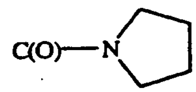
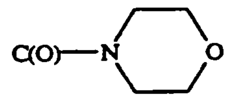
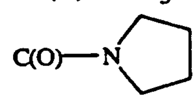
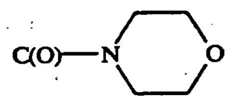
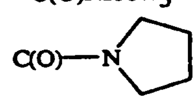
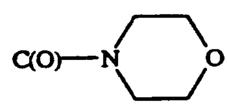
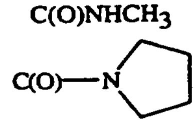
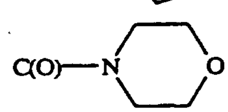
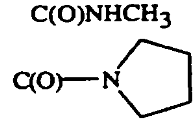
Cl	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Cl	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Cl	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Cl	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	1	H	CH_2Cl
Cl	Br	CH_2	1	1	H	CH_2Br
Cl	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CH_2	1	2	H	CH_2Cl
Cl	Br	CH_2	1	2	H	CH_2Br
Cl	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	1	H	CH_2Cl
Cl	Br	CHF	1	1	H	CH_2Br
Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHF	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHF	1	2	H	CH_2Cl
Cl	Br	CHF	1	2	H	CH_2Br
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CHF	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHF	1	2	$CH_2C{\equiv}CH$	CH_2Br

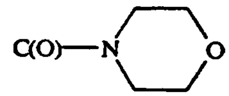
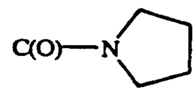
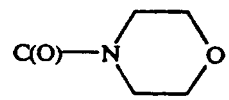
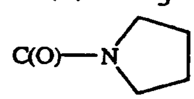
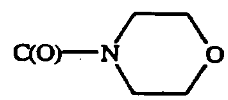
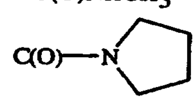
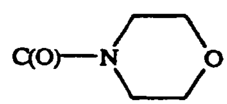
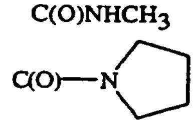
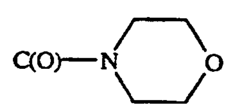
Cl	Br	CHCl	1	1	H	CH_2Cl
Cl	Br	CHCl	1	1	H	CH_2Br
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	Br	CHCl	1	2	H	CH_2Cl
Cl	Br	CHCl	1	2	H	CH_2Br
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	Br	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	Br	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	Br	CHCl	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CH_2	1	1	H	CH_2Cl
Cl	CN	CH_2	1	1	H	CH_2Br
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	1	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CH_2	1	1	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CH_2	1	2	H	CH_2Cl
Cl	CN	CH_2	1	2	H	CH_2Br
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CH_2	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CH_2	1	2	CO_2CH_3	CH_2Br
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Cl
Cl	CN	CH_2	1	2	$CH_2C{\equiv}CH$	CH_2Br
Cl	CN	CHF	1	1	H	CH_2Cl
Cl	CN	CHF	1	1	H	CH_2Br
Cl	CN	CHF	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHF	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	1	CO_2CH_3	CH_2Br

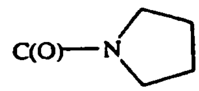
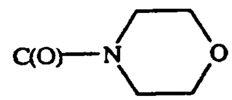
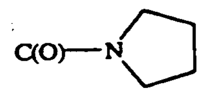
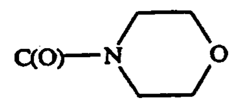
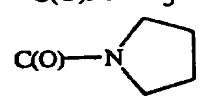
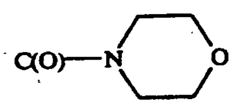
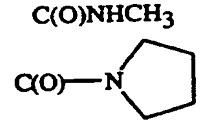
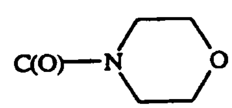
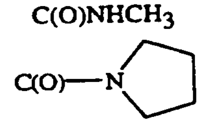
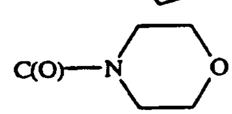
Cl	CN	CHF	1	1	$CH_2C\equiv CH$	CH_2Cl
Cl	CN	CHF	1	1	$CH_2C\equiv CH$	CH_2Br
Cl	CN	CHF	1	2	H	CH_2Cl
Cl	CN	CHF	1	2	H	CH_2Br
Cl	CN	CHF	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHF	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CHF	1	2	CO_2CH_3	CH_2Br
Cl	CN	CHF	1	2	$CH_2C\equiv CH$	CH_2Cl
Cl	CN	CHF	1	2	$CH_2C\equiv CH$	CH_2Br
Cl	CN	CHCl	1	1	H	CH_2Cl
Cl	CN	CHCl	1	1	H	CH_2Br
Cl	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHCl	1	1	$C(=O)CH_3$	CH_2Br
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Cl
Cl	CN	CHCl	1	1	CO_2CH_3	CH_2Br
Cl	CN	CHCl	1	1	$CH_2C\equiv CH$	CH_2Cl
Cl	CN	CHCl	1	1	$CH_2C\equiv CH$	CH_2Br
Cl	CN	CHCl	1	2	H	CH_2Cl
Cl	CN	CHCl	1	2	H	CH_2Br
Cl	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Cl
Cl	CN	CHCl	1	2	$C(=O)CH_3$	CH_2Br
Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Cl
Cl	CN	CHCl	1	2	CO_2CH_3	CH_2Br
Cl	CN	CHCl	1	2	$CH_2C\equiv CH$	CH_2Cl
Cl	CN	CHCl	1	2	$CH_2C\equiv CH$	CH_2Br

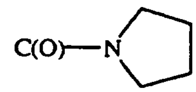
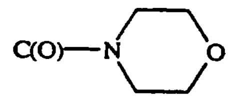
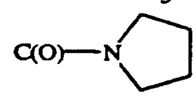
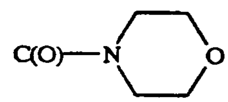
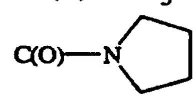
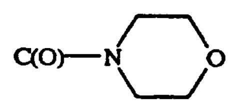
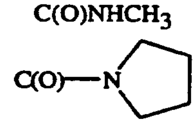
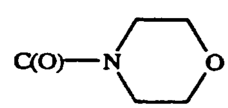
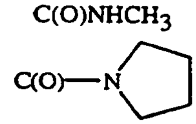
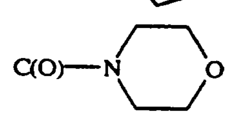
J = 19, X = F, Y = Cl, n = m = 1

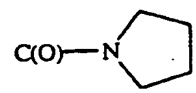
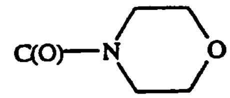
Z	R^1	R^2	R^{24}
CHF	H	CH_2Cl	$CO_2CH_2CH_3$
CHF	H	CH_2Cl	$C(O)N(CH_2CH_3)_2$
CHF	H	CH_2Cl	$C(O)NHCH_3$
CHF	H	CH_2Cl	
CHF	H	CH_2Cl	

CHF	H	CH_2Br	$CO_2CH_2CH_3$
CHF	H	CH_2Br	$C(O)N(CH_2CH_3)_2$
CHF	H	CH_2Br	$C(O)NHCH_3$
CHF	H	CH_2Br	
CHF	H	CH_2Br	
CHF	H	CH_2F	$CO_2CH_2CH_3$
CHF	H	CH_2F	$C(O)N(CH_2CH_3)_2$
CHF	H	CH_2F	$C(O)NHCH_3$
CHF	H	CH_2F	
CHF	H	CH_2F	
CHF	H	CH_2OCH_3	$CO_2CH_2CH_3$
CHF	H	CH_2OCH_3	$C(O)N(CH_2CH_3)_2$
CHF	H	CH_2OCH_3	$C(O)NHCH_3$
CHF	H	CH_2OCH_3	
CHF	H	CH_2OCH_3	
CHF	H	CH_2CN	$CO_2CH_2CH_3$
CHF	H	CH_2CN	$C(O)N(CH_2CH_3)_2$
CHF	H	CH_2CN	$C(O)NHCH_3$
CHF	H	CH_2CN	
CHF	H	CH_2CN	
CHF	H	CH_2SCH_3	$CO_2CH_2CH_3$
CHF	H	CH_2SCH_3	$C(O)N(CH_2CH_3)_2$
CHF	H	CH_2SCH_3	$C(O)NHCH_3$
CHF	H	CH_2SCH_3	

CHF	H	CH_2SCH_3	
CHF	H	$CH_2SO_2CH_3$	$CO_2CH_2CH_3$
CHF	H	$CH_2SO_2CH_3$	$C(O)N(CH_2CH_3)_2$
CHF	H	$CH_2SO_2CH_3$	$C(O)NHCH_3$
CHF	H	$CH_2SO_2CH_3$	
CHF	H	$CH_2SO_2CH_3$	
CHCl	H	CH_2Cl	$CO_2CH_2CH_3$
CHCl	H	CH_2Cl	$C(O)N(CH_2CH_3)_2$
CHCl	H	CH_2Cl	$C(O)NHCH_3$
CHCl	H	CH_2Cl	
CHCl	H	CH_2Cl	
CHCl	H	CH_2Br	$CO_2CH_2CH_3$
CHCl	H	CH_2Br	$C(O)N(CH_2CH_3)_2$
CHCl	H	CH_2Br	$C(O)NHCH_3$
CHCl	H	CH_2Br	
CHCl	H	CH_2Br	
CHCl	H	CH_2F	$CO_2CH_2CH_3$
CHCl	H	CH_2F	$C(O)N(CH_2CH_3)_2$
CHCl	H	CH_2F	$C(O)NHCH_3$
CHCl	H	CH_2F	
CHCl	H	CH_2F	
CHCl	H	CH_2OCH_3	$CO_2CH_2CH_3$
CHCl	H	CH_2OCH_3	$C(O)N(CH_2CH_3)_2$
CHCl	H	CH_2OCH_3	$C(O)NHCH_3$

CHCl	H	CH_2OCH_3	
CHCl	H	CH_2OCH_3	
CHCl	H	CH_2CN	$CO_2CH_2CH_3$
CHCl	H	CH_2CN	$C(O)N(CH_2CH_3)_2$
CHCl	H	CH_2CN	$C(O)NHCH_3$
CHCl	H	CH_2CN	
CHCl	H	CH_2CN	
CHCl	H	CH_2SCH_3	$CO_2CH_2CH_3$
CHCl	H	CH_2SCH_3	$C(O)N(CH_2CH_3)_2$
CHCl	H	CH_2SCH_3	$C(O)NHCH_3$
CHCl	H	CH_2SCH_3	
CHCl	H	CH_2SCH_3	
CHCl	H	$CH_2SO_2CH_3$	$CO_2CH_2CH_3$
CHCl	H	$CH_2SO_2CH_3$	$C(O)N(CH_2CH_3)_2$
CHCl	H	$CH_2SO_2CH_3$	$C(O)NHCH_3$
CHCl	H	$CH_2SO_2CH_3$	
CHCl	H	$CH_2SO_2CH_3$	
CHBr	H	CH_2Cl	$CO_2CH_2CH_3$
CHBr	H	CH_2Cl	$C(O)N(CH_2CH_3)_2$
CHBr	H	CH_2Cl	$C(O)NHCH_3$
CHBr	H	CH_2Cl	
CHBr	H	CH_2Cl	
CHBr	H	CH_2Br	$CO_2CH_2CH_3$
CHBr	H	CH_2Br	$C(O)N(CH_2CH_3)_2$

CHBr	H	CH_2Br	C(O)NHCH$_3$
CHBr	H	CH_2Br	
CHBr	H	CH_2Br	
CHBr	H	CH_2F	$CO_2CH_2CH_3$
CHBr	H	CH_2F	$C(O)N(CH_2CH_3)_2$
CHBr	H	CH_2F	C(O)NHCH$_3$
CHBr	H	CH_2F	
CHBr	H	CH_2F	
CHBr	H	CH_2OCH_3	$CO_2CH_2CH_3$
CHBr	H	CH_2OCH_3	$C(O)N(CH_2CH_3)_2$
CHBr	H	CH_2OCH_3	C(O)NHCH$_3$
CHBr	H	CH_2OCH_3	
CHBr	H	CH_2OCH_3	
CHBr	H	CH_2CN	$CO_2CH_2CH_3$
CHBr	H	CH_2CN	$C(O)N(CH_2CH_3)_2$
CHBr	H	CH_2CN	C(O)NHCH$_3$
CHBr	H	CH_2CN	
CHBr	H	CH_2CN	
CHBr	H	CH_2SCH_3	$CO_2CH_2CH_3$
CHBr	H	CH_2SCH_3	$C(O)N(CH_2CH_3)_2$
CHBr	H	CH_2SCH_3	C(O)NHCH$_3$
CHBr	H	CH_2SCH_3	
CHBr	H	CH_2SCH_3	
CHBr	H	$CH_2SO_2CH_3$	$CO_2CH_2CH_3$

CHBr	H	$CH_2SO_2CH_3$	$C(O)N(CH_2CH_3)_2$
CHBr	H	$CH_2SO_2CH_3$	$C(O)NHCH_3$
CHBr	H	$CH_2SO_2CH_3$	
CHBr	H	$CH_2SO_2CH_3$	

Formulation/Utility

Compounds of this invention will generally be used as a formulation or composition with an agriculturally suitable carrier comprising at least one of a liquid diluent, a solid diluent or a surfactant. The formulation or composition ingredients are selected to be consistent with the physical properties of the active ingredient, mode of application and environmental factors such as soil type, moisture and temperature. Useful formulations include liquids such as solutions (including emulsifiable concentrates), suspensions, emulsions (including microemulsions and/or suspoemulsions) and the like which optionally can be thickened into gels. Useful formulations further include solids such as dusts, powders, granules, pellets, tablets, films, and the like which can be water-dispersible ("wettable") or water-soluble. Active ingredient can be (micro)encapsulated and further formed into a suspension or solid formulation; alternatively the entire formulation of active ingredient can be encapsulated (or "overcoated"). Encapsulation can control or delay release of the active ingredient. Sprayable formulations can be extended in suitable media and used at spray volumes from about one to several hundred liters per hectare. High-strength compositions are primarily used as intermediates for further formulation.

The formulations will typically contain effective amounts of active ingredient, diluent and surfactant within the following approximate ranges which add up to 100 percent by weight.

	Weight Percent		
	Active Ingredient	Diluent	Surfactant
Water-Dispersible and Water-soluble Granules, Tablets and Powders.	5–90	0–94	1–15
Suspensions, Emulsions, Solutions (including Emulsifiable Concentrates)	5–50	40–95	0–15
Dusts	1–25	70–99	0–5
Granules and Pellets	0.01n99	5–99.99	0–15
High Strength Compositions	90–99	0–10	0–2

Typical solid diluents are described in Watkins, et al., *Handbook of Insecticide Dust Diluents and Carriers*, 2nd Ed., Dorland Books, Caldwell, New Jersey. Typical liquid diluents are described in Marsden, *Solvents Guide*, 2nd Ed., Interscience, New York, 1950. *McCutcheon's Detergents and Emulsifiers Annual*, Allured Publ. Corp., Ridgewood, New Jersey, as well as Sisely and Wood, *Encyclopedia of Surface Active Agents*, Chemical Publ. Co., Inc., New York, 1964, list surfactants and recommended uses. All formulations can contain minor amounts of additives to reduce foam, caking, corrosion, microbiological growth and the like, or thickeners to increase viscosity.

Surfactants include, for example, polyethoxylated alcohols, polyethoxylated alkylphenols, polyethoxylated sorbitan fatty acid esters, dialkyl sulfosuccinates, alkyl sulfates, alkylbenzene sulfonates, organosilicones, *N*,*N*-dialkyltaurates, lignin sulfonates, naphthalene sulfonate formaldehyde condensates, polycarboxylates, and polyoxyethylene/polyoxypropylene block copolymers. Solid diluents include, for example, clays such as bentonite, montmorillonite, attapulgite and kaolin, starch, sugar, silica, talc, diatomaceous earth, urea, calcium carbonate, sodium carbonate and bicarbonate, and sodium sulfate. Liquid diluents include, for example, water, *N*,*N*-dimethylformamide, dimethyl sulfoxide, *N*-alkylpyrrolidone, ethylene glycol, polypropylene glycol, paraffins, alkylbenzenes, alkylnaphthalenes, oils of olive, castor, linseed, tung, sesame, corn, peanut, cotton-seed, soybean, rape-seed and coconut, fatty acid esters, ketones such as cyclohexanone, 2-heptanone, isophorone and 4-hydroxy-4-methyl-2-pentanone, and alcohols such as methanol, cyclohexanol, decanol and tetrahydrofurfuryl alcohol.

Solutions, including emulsifiable concentrates, can be prepared by simply mixing the ingredients. Dusts and powders can be prepared by blending and, usually, grinding as in a hammer mill or fluid-energy mill. Suspensions are usually prepared by wet-milling; see, for example, U.S. 3,060,084. Granules and pellets can be prepared by spraying the active material upon preformed granular carriers or by agglomeration techniques. See Browning, "Agglomeration", *Chemical Engineering*, December 4, 1967, pp 147-48, *Perry's Chemical Engineer's Handbook*, 4th Ed., McGraw-Hill, New York, 1963, pages 8-57 and following, and WO 91/13546. Pellets can be prepared as described in U.S. 4,172,714. Water-dispersible and water-soluble granules can be prepared as taught in U.S. 4,144,050, U.S. 3,920,442 and DE 3,246,493. Tablets can be prepared as taught in U.S. 5,180,587, U.S. 5,232,701 and U.S. 5,208,030. Films can be prepared as taught in GB 2,095,558 and U.S. 3,299,566.

For further information regarding the art of formulation, see U.S. 3,235,361, Col. 6, line 16 through Col. 7, line 19 and Examples 10-41; U.S. 3,309,192, Col. 5, line 43 through Col. 7, line 62 and Examples 8, 12, 15, 39, 41, 52, 53, 58, 132, 138-140, 162-164, 166, 167 and 169-182; U.S. 2,891,855, Col. 3, line 66 through Col. 5, line 17

and Examples 1-4; Klingman, *Weed Control as a Science*, John Wiley and Sons, Inc., New York, 1961, pp 81-96; and Hance et al., *Weed Control Handbook*, 8th Ed., Blackwell Scientific Publications, Oxford, 1989.

In the following Examples, all percentages are by weight and all formulations are prepared in conventional ways. Compound numbers refer to compounds in Index Tables A-J.

Example A

High Strength Concentrate

Compound 23	98.5%
silica aerogel	0.5%
synthetic amorphous fine silica	1.0%.

Example B

Wettable Powder

Compound 25	65.0%
dodecylphenol polyethylene glycol ether	2.0%
sodium ligninsulfonate	4.0%
sodium silicoaluminate	6.0%
montmorillonite (calcined)	23.0%.

Example C

Granule

Compound 21	10.0%
attapulgite granules (low volatile matter, 0.71/0.30 mm; U.S.S. No. 25–50 sieves)	90.0%.

Example D

Extruded Pellet

Compound 52	25.0%
anhydrous sodium sulfate	10.0%
crude calcium ligninsulfonate	5.0%
sodium alkylnaphthalenesulfonate	1.0%
calcium/magnesium bentonite	59.0%.

Test results indicate that the compounds of the present invention are highly active preemergent and postemergent herbicides or plant growth regulants. Many of them have utility for broad-spectrum pre- and/or postemergence weed control in areas where complete control of all vegetation is desired such as around fuel storage tanks, industrial storage areas, parking lots, drive-in theaters, air fields, river banks, irrigation and other waterways, around billboards and highway and railroad structures. Some of the compounds are useful for the control of selected grass and broadleaf weeds with tolerance to important agronomic crops which include but are not limited to alfalfa,

barley, cotton, wheat, rape, sugar beets, corn (maize), sorghum, soybeans, rice, oats, peanuts, vegetables, tomato, potato, perennial plantation crops including coffee, cocoa, oil palm, rubber, sugarcane, citrus, grapes, fruit trees, nut trees, banana, plantain, pineapple, hops, tea and forests such as eucalyptus and conifers (e.g., loblolly pine), and turf species (e.g., Kentucky bluegrass, St. Augustine grass, Kentucky fescue and Bermuda grass). Those skilled in the art will appreciate that not all compounds are equally effective against all weeds. Alternatively, the subject compounds are useful to modify plant growth.

Compounds of this invention can be used alone or in combination with other commercial herbicides, insecticides or fungicides. Compounds of this invention can also be used in combination with commercial herbicide safeners such as benoxacor, dichlormid and furilazole to increase safety to certain crops. A mixture of one or more of the following herbicides with a compound of this invention may be particularly useful for weed control: acetochlor, acifluorfen and its sodium salt, aclonifen, acrolein (2-propenal), alachlor, ametryn, amidosulfuron, amitrole, ammonium sulfamate, anilofos, asulam, atrazine, azimsulfuron, benazolin, benazolin-ethyl, benfluralin, benfuresate, bensulfuron-methyl, bensulide, bentazone, bifenox, bromacil, bromoxynil, bromoxynil octanoate, butachlor, butralin, butylate, chlomethoxyfen, chloramben, chlorbromuron, chloridazon, chlorimuron-ethyl, chlornitrofen, chlorotoluron, chlorpropham, chlorsulfuron, chlorthal-dimethyl, cinmethylin, cinosulfuron, clethodim, clomazone, clopyralid, clopyralid-olamine, cyanazine, cycloate, cyclosulfamuron, 2,4-D and its butotyl, butyl, isoctyl and isopropyl esters and its dimethylammonium, diolamine and trolamine salts, daimuron, dalapon, dalapon-sodium, dazomet, 2,4-DB and its dimethylammonium, potassium and sodium salts, desmedipham, desmetryn, dicamba and its diglycolammonium, dimethylammonium, potassium and sodium salts, dichlobenil, dichlorprop, diclofop-methyl, 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imidazol-2-yl]-5-methyl-3-pyridinecarboxylic acid (AC 263,222), difenzoquat metilsulfate, diflufenican, dimepiperate, dimethenamid, dimethylarsinic acid and its sodium salt, dinitramine, diphenamid, diquat dibromide, dithiopyr, diuron, DNOC, endothal, EPTC, esprocarb, ethalfluralin, ethametsulfuron-methyl, ethofumesate, ethyl α,2-dichloro-5-[4-(difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1*H*-1,2,4-triazol-1-yl]-4-fluorobenzenepropanoate (F8426), fenoxaprop-ethyl, fenoxaprop-P-ethyl, fenuron, fenuron-TCA, flamprop-methyl, flamprop-M-isopropyl, flamprop-M-methyl, flazasulfuron, fluazifop-butyl, fluazifop-P-butyl, fluchloralin, flumetsulam, flumiclorac-pentyl, flumioxazin, fluometuron, fluoroglycofen-ethyl, flupoxam, fluridone, flurochloridone, fluroxypyr, fomesafen, fosamine-ammonium, glufosinate, glufosinate-ammonium, glyphosate, glyphosate-isopropylammonium, glyphosate-sesquisodium, glyphosate-trimesium, halosulfuron-methyl, haloxyfop-ethyl,

haloxyfop-methyl, hexazinone, imazamethabenz-methyl, imazamox (AC 299 263), imazapyr, imazaquin, imazaquin-ammonium, imazethapyr, imazethapyr-ammonium, imazosulfuron, ioxynil, ioxynil octanoate, ioxynil-sodium, isoproturon, isouron, isoxaben, isoxaflutole (RPA 201772), lactofen, lenacil, linuron, maleic hydrazide, MCPA and its dimethylammonium, potassium and sodium salts, MCPA-isoctyl, mecoprop, mecoprop-P, mefenacet, mefluidide, metam-sodium, methabenzthiazuron, methyl [[2-chloro-4-fluoro-5-[(tetrahydro-3-oxo-1*H*,3*H*-[1,3,4]thiadiazolo[3,4-*a*]pyridazin-1-ylidene)amino]phenyl]thioacetate (KIH 9201), methylarsonic acid and its calcium, monoammonium, monosodium and disodium salts, methyl [[[1-[5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrophenyl]-2-methoxyethylidene]amino]oxy]acetate (AKH-7088), methyl 5-[[[[(4,6-dimethyl-2-pyrimidinyl)amino]carbonyl]amino]sulfonyl]-1-(2-pyridinyl)-1*H*-pyrazole-4-carboxylate (NC-330), metobenzuron, metolachlor, metosulam, metoxuron, metribuzin, metsulfuron-methyl, molinate, monolinuron, napropamide, naptalam, neburon, nicosulfuron, norflurazon, oryzalin, oxadiazon, 3-oxetanyl 2-[[[[(4,6-dimethyl-2-pyrimidinyl)amino]carbonyl]amino]sulfonyl]benzoate (CGA 277476), oxyfluorfen, paraquat dichloride, pebulate, pendimethalin, perfluidone, phenmedipham, picloram, picloram-potassium, pretilachlor, primisulfuron-methyl, prometon, prometryn, propachlor, propanil, propaquizafop, propazine, propham, propyzamide, prosulfuron, pyrazolynate, pyrazosulfuron-ethyl, pyridate, pyrithiobac, pyrithiobac-sodium, quinclorac, quizalofop-ethyl, quizalofop-P-ethyl, quizalofop-P-tefuryl, rimsulfuron, sethoxydim, siduron, simazine, sulcotrione (ICIA0051), sulfentrazone, sulfometuron-methyl, TCA, TCA-sodium, tebuthiuron, terbacil, terbuthylazine, terbutryn, thenylchlor, thiafluamide (BAY 11390), thifensulfuron-methyl, thiobencarb, tralkoxydim, tri-allate, triasulfuron, tribenuron-methyl, triclopyr, triclopyr-butotyl, triclopyr-triethylammonium, tridiphane, trifluralin, triflusulfuron-methyl, and vernolate.

In certain instances, combinations with other herbicides having a similar spectrum of control but a different mode of action will be particularly advantageous for preventing the development of resistant weeds.

Certain combinations of compounds of this invention with other herbicides may provide synergistic herbicidal effects on weeds or may provide enhanced crop safety.

Preferred for better control of undesired vegetation in corn (e.g., lower use rate, broader spectrum of weeds controlled, or enhanced crop safety) or for preventing the development of resistant weeds in corn are mixtures of a compound of this invention with one or more of the herbicides selected from the group rimsulfuron, thifensulfuron-methyl, chlorimuron-ethyl, nicosulfuron, prosulfuron, primsulfuron, atrazine, terbuthylazine, dicamba, 2,4-D, bomoxynil, pyridate, sulcotrione, glufosinate, glyphosate, glyphosate-trimesium, fluthiacet-methyl, quizalofop-p-ethyl, bentazone, clopyralid, flumetsulam, halosulfuron, sethoxydim, flumiclorac-pentyl, imozamox, acetachlor, alachlor, dimethenamid, isoxaflutole, metolachlor, metribuzin, pendimethalin, and thiafluimid.

Preferred for better control of undesired vegetation in soybeans (e.g., lower use rate, broader spectrum of weeds controlled, or enhanced crop safety) or for preventing the development of resistant weeds in soybeans are mixtures of a compound of this invention with one or more of the herbicides selected from the group chlorimuron-ethyl, thifensulfuron-methyl, clethodim, sethoxydim, fluazifop-p-butyl, haloxyfop, imazethapyr, imozamox, imazaquin, glufosinate, glyphosate, glyphosate-trimesium, lactofen, fluthiacet-methyl, quizalofop-p-ethyl, acifluorfen-sodium, oxasulfuron, imazameth, flumiclorac-pentyl, and bentazone.

Preferred for better control of undesired vegetation in winter wheat, winter barley, spring wheat, spring barley, and peas (e.g., lower use rate, broader spectrum of weeds controlled, or enhanced crop safety) or for preventing the development of resistant weeds in winter wheat, winter barley, spring wheat, spring barley, and peas are mixtures of a compound of this invention with one or more of the herbicides selected from the group tribenuron-methyl, thifensulfuron-methyl, metsulfuron-methyl, chlorsulfuron, triasulfuron, 2,4-D, dicamba, bromoxynil, MCPA, fluroxypyr, clopyralid, fenoxaprop, fenchlorazole, diclofop, tralkoxydim, clodinafop, cloquintocet-mexyl, imazamethabenz, sulfosulfuron, difenzoquat, propanil, prosulfuron, metribuzin, glyphosate, triallate, trifluralin, paraquat, diallate, linuron, diflufenican, pendimethalin, cyanazine, neburon, terbutryn, prosulfocarb, isoproturon, chlortoluron, methabenzthiazuron, metoxuron, simazine, ioxynil, mecoprop, metosulam, fluroglycophen-ethyl, flamprop-M-isopropyl, and benzoylpropethyl.

Specifically preferred mixtures for use in corn are selected from the group:

a) (6*S-cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	rimsulfuron	2	thifensulfuron-methyl
3	chlorimuron-ethyl	4	rimsulfuron (B1) in combination with thifensulfuron-methyl (B2)
5	nicosulfuron	6	rimsulfuron (B3) in combination with nicosulfuron (B4)
7	rimsulfuron (B5) in combination with nicosulfuron (B6) in combination with thifensulfuron-methyl (B7)	8	prosulfuron
9	prosulfuron (B8) in combination with primsulfuron (B9)	10	atrazine
11	terbuthylazine	12	dicamba
13	2,4-D	14	bromoxynil
15	pyridate	16	sulcotrione
17	glufosinate	18	glyphosate
19	glyphosate-trimesium		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:20 to 4:1, with B being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha. Combination 2 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 4 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B2 being applied at a rate

of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A to B of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 6 is generally used in a ratio of A to B3 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B4 of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B3 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B4 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 7 is generally used in a ratio of A to B5 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B6 of 1:2,000 to 5:1, preferably 1:50 to 2:1, and a ratio of A to B7 of 1:500 to 50:1, preferably 1:10 to 20:1, with B5 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B6 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha, and B7 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 9 is generally used in a ratio of A to B8 of 1:1,000 to 5:1, preferably 1:60 to 1:1, and a ratio of A to B9 of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B8 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha, and B9 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:10, preferably 1:1,000 to 1:25, with B being applied at a rate of 500 to 3,000 g/ha, preferably 500 to 1,000 g/ha. Combination 11 is generally used in a ratio of A to B of 1:50,000 to 1:10, preferably 1:2,000 to 1:25, with B being applied at a rate of 500 to 5,000 g/ha, preferably 500 to 2,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 16 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 17 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 18 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha.

b) (6*S*-*cis*)-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]-*N*-[(chloromethyl)sulfonyl]acetamide (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	rimsulfuron	2	thifensulfuron-methyl
3	chlorimuron-ethyl	4	rimsulfuron (B1) in combination with thifensulfuron-methyl (B2)
5	nicosulfuron	6	rimsulfuron (B3) in combination with nicosulfuron (B4)
7	rimsulfuron (B5) in combination with nicosulfuron (B6) in combination with thifensulfuron-methyl (B7)	8	prosulfuron
9	prosulfuron (B8) in combination with primsulfuron (B9)	10	atrazine
11	terbuthylazine	12	dicamba
13	2,4-D	14	bromoxynil
15	pyridate	16	sulcotrione
17	glufosinate	18	glyphosate
19	glyphosate-trimesium		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:20 to 4:1, with B being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha. Combination 2 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 4 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A

to B of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 6 is generally used in a ratio of A to B3 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B4 of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B3 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B4 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 7 is generally used in a ratio of A to B5 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B6 of 1:2,000 to 5:1, preferably 1:50 to 2:1, and a ratio of A to B7 of 1:500 to 50:1, preferably 1:10 to 20:1, with B5 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B6 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha, and B7 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 9 is generally used in a ratio of A to B8 of 1:1,000 to 5:1, preferably 1:60 to 1:1, and a ratio of A to B9 of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B8 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha, and B9 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:10, preferably 1:1,000 to 1:25, with B being applied at a rate of 500 to 3,000 g/ha, preferably 500 to 1,000 g/ha. Combination 11 is generally used in a ratio of A to B of 1:50,000 to 1:10, preferably 1:2,000 to 1:25, with B being applied at a rate of 500 to 5,000 g/ha, preferably 500 to 2,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 16 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 17 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 18 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha.

c) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	rimsulfuron	2	thifensulfuron-methyl
3	chlorimuron-ethyl	4	rimsulfuron (B1) in combination with thifensulfuron-methyl (B2)
5	nicosulfuron	6	rimsulfuron (B3) in combination with nicosulfuron (B4)
7	rimsulfuron (B5) in combination with nicosulfuron (B6) in combination with thifensulfuron-methyl (B7)	8	prosulfuron
9	prosulfuron (B8) in combination with primsulfuron (B9)	10	atrazine
11	terbuthylazine	12	dicamba
13	2,4-D	14	bromoxynil
15	pyridate	16	sulcotrione
17	glufosinate	18	glyphosate
19	glyphosate-trimesium		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:20 to 4:1, with B being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha. Combination 2 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 4 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A

to B of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 6 is generally used in a ratio of A to B3 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B4 of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B3 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B4 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 7 is generally used in a ratio of A to B5 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B6 of 1:2,000 to 5:1, preferably 1:50 to 2:1, and a ratio of A to B7 of 1:500 to 50:1, preferably 1:10 to 20:1, with B5 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B6 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha, and B7 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 9 is generally used in a ratio of A to B8 of 1:1,000 to 5:1, preferably 1:60 to 1:1, and a ratio of A to B9 of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B8 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha, and B9 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:10, preferably 1:1,000 to 1:25, with B being applied at a rate of 500 to 3,000 g/ha, preferably 500 to 1,000 g/ha. Combination 11 is generally used in a ratio of A to B of 1:50,000 to 1:10, preferably 1:2,000 to 1:25, with B being applied at a rate of 500 to 5,000 g/ha, preferably 500 to 2,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 16 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 17 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 18 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha.

d) (6*S*-*cis*)-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl)-*N*-[(chloromethyl)sulfonyl]acetamide (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	rimsulfuron	2	thifensulfuron-methyl
3	chlorimuron-ethyl	4	rimsulfuron (B1) in combination with thifensulfuron-methyl (B2)
5	nicosulfuron	6	rimsulfuron (B3) in combination with nicosulfuron (B4)
7	rimsulfuron (B5) in combination with nicosulfuron (B6) in combination with thifensulfuron-methyl (B7)	8	prosulfuron
9	prosulfuron (B8) in combination with primsulfuron (B9)	10	atrazine
11	terbuthylazine	12	dicamba
13	2,4-D	14	bromoxynil
15	pyridate	16	sulcotrione
17	glufosinate	18	glyphosate
19	glyphosate-trimesium		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:20 to 4:1, with B being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha. Combination 2 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 4 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A

to B of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 6 is generally used in a ratio of A to B3 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B4 of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B3 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B4 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 7 is generally used in a ratio of A to B5 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B6 of 1:2,000 to 5:1, preferably 1:50 to 2:1, and a ratio of A to B7 of 1:500 to 50:1, preferably 1:10 to 20:1, with B5 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B6 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha, and B7 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 9 is generally used in a ratio of A to B8 of 1:1,000 to 5:1, preferably 1:60 to 1:1, and a ratio of A to B9 of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B8 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha, and B9 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:10, preferably 1:1,000 to 1:25, with B being applied at a rate of 500 to 3,000 g/ha, preferably 500 to 1,000 g/ha. Combination 11 is generally used in a ratio of A to B of 1:50,000 to 1:10, preferably 1:2,000 to 1:25, with B being applied at a rate of 500 to 5,000 g/ha, preferably 500 to 2,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 16 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 17 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 18 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha.

e) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide monosodium salt (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	rimsulfuron	2	thifensulfuron-methyl
3	chlorimuron-ethyl	4	rimsulfuron (B1) in combination with thifensulfuron-methyl (B2)
5	nicosulfuron	6	rimsulfuron (B3) in combination with nicosulfuron (B4)
7	rimsulfuron (B5) in combination with nicosulfuron (B6) in combination with thifensulfuron-methyl (B7)	8	prosulfuron
9	prosulfuron (B8) in combination with primsulfuron (B9)	10	atrazine
11	terbuthylazine	12	dicamba
13	2,4-D	14	bromoxynil
15	pyridate	16	sulcotrione
17	glufosinate	18	glyphosate
19	glyphosate-trimesium		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:20 to 4:1, with B being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha. Combination 2 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 4 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A

to B of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 6 is generally used in a ratio of A to B3 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B4 of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B3 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B4 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 7 is generally used in a ratio of A to B5 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B6 of 1:2,000 to 5:1, preferably 1:50 to 2:1, and a ratio of A to B7 of 1:500 to 50:1, preferably 1:10 to 20:1, with B5 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B6 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha, and B7 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 9 is generally used in a ratio of A to B8 of 1:1,000 to 5:1, preferably 1:60 to 1:1, and a ratio of A to B9 of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B8 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha, and B9 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:10, preferably 1:1,000 to 1:25, with B being applied at a rate of 500 to 3,000 g/ha, preferably 500 to 1,000 g/ha. Combination 11 is generally used in a ratio of A to B of 1:50,000 to 1:10, preferably 1:2,000 to 1:25, with B being applied at a rate of 500 to 5,000 g/ha, preferably 500 to 2,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 16 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 17 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 18 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha.

f) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide monopotassium salt (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	rimsulfuron	2	thifensulfuron-methyl
3	chlorimuron-ethyl	4	rimsulfuron (B1) in combination with thifensulfuron-methyl (B2)
5	nicosulfuron	6	rimsulfuron (B3) in combination with nicosulfuron (B4)
7	rimsulfuron (B5) in combination with nicosulfuron (B6) in combination with thifensulfuron-methyl (B7)	8	prosulfuron
9	prosulfuron (B8) in combination with primsulfuron (B9)	10	atrazine
11	terbuthylazine	12	dicamba
13	2,4-D	14	bromoxynil
15	pyridate	16	sulcotrione
17	glufosinate	18	glyphosate
19	glyphosate-trimesium		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:20 to 4:1, with B being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha. Combination 2 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 4 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A

to B of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 6 is generally used in a ratio of A to B3 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B4 of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B3 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B4 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 7 is generally used in a ratio of A to B5 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B6 of 1:2,000 to 5:1, preferably 1:50 to 2:1, and a ratio of A to B7 of 1:500 to 50:1, preferably 1:10 to 20:1, with B5 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B6 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha, and B7 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 9 is generally used in a ratio of A to B8 of 1:1,000 to 5:1, preferably 1:60 to 1:1, and a ratio of A to B9 of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B8 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha, and B9 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:10, preferably 1:1,000 to 1:25, with B being applied at a rate of 500 to 3,000 g/ha, preferably 500 to 1,000 g/ha. Combination 11 is generally used in a ratio of A to B of 1:50,000 to 1:10, preferably 1:2,000 to 1:25, with B being applied at a rate of 500 to 5,000 g/ha, preferably 500 to 2,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 16 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 17 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 18 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha.

g) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide monosodium salt (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	rimsulfuron	2	thifensulfuron-methyl
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5	nicosulfuron	6	rimsulfuron (B3) in combination with nicosulfuron (B4)
7	rimsulfuron (B5) in combination with nicosulfuron (B6) in combination with thifensulfuron-methyl (B7)	8	prosulfuron
9	prosulfuron (B8) in combination with primsulfuron (B9)	10	atrazine
11	terbuthylazine	12	dicamba
13	2,4-D	14	bromoxynil
15	pyridate	16	sulcotrione
17	glufosinate	18	glyphosate
19	glyphosate-trimesium		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:20 to 4:1, with B being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha. Combination 2 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 4 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A

to B of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 6 is generally used in a ratio of A to B3 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B4 of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B3 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B4 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 7 is generally used in a ratio of A to B5 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B6 of 1:2,000 to 5:1, preferably 1:50 to 2:1, and a ratio of A to B7 of 1:500 to 50:1, preferably 1:10 to 20:1, with B5 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B6 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha, and B7 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 9 is generally used in a ratio of A to B8 of 1:1,000 to 5:1, preferably 1:60 to 1:1, and a ratio of A to B9 of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B8 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha, and B9 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:10, preferably 1:1,000 to 1:25, with B being applied at a rate of 500 to 3,000 g/ha, preferably 500 to 1,000 g/ha. Combination 11 is generally used in a ratio of A to B of 1:50,000 to 1:10, preferably 1:2,000 to 1:25, with B being applied at a rate of 500 to 5,000 g/ha, preferably 500 to 2,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 16 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 17 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 18 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha.

h) (6*S-cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide monopotassium salt (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	rimsulfuron	2	thifensulfuron-methyl
3	chlorimuron-ethyl	4	rimsulfuron (B1) in combination with thifensulfuron-methyl (B2)
5	nicosulfuron	6	rimsulfuron (B3) in combination with nicosulfuron (B4)
7	rimsulfuron (B5) in combination with nicosulfuron (B6) in combination with thifensulfuron-methyl (B7)	8	prosulfuron
9	prosulfuron (B8) in combination with primsulfuron (B9)	10	atrazine
11	terbuthylazine	12	dicamba
13	2,4-D	14	bromoxynil
15	pyridate	16	sulcotrione
17	glufosinate	18	glyphosate
19	glyphosate-trimesium		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:20 to 4:1, with B being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha. Combination 2 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 4 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A

to B of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 6 is generally used in a ratio of A to B3 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B4 of 1:2,000 to 5:1, preferably 1:50 to 2:1, with B3 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B4 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha. Combination 7 is generally used in a ratio of A to B5 of 1:500 to 50:1, preferably 1:20 to 4:1, and a ratio of A to B6 of 1:2,000 to 5:1, preferably 1:50 to 2:1, and a ratio of A to B7 of 1:500 to 50:1, preferably 1:10 to 20:1, with B5 being applied at a rate of 1 to 50 g/ha, preferably 5 to 20 g/ha, and B6 being applied at a rate of 10 to 200 g/ha, preferably 10 to 50 g/ha, and B7 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 9 is generally used in a ratio of A to B8 of 1:1,000 to 5:1, preferably 1:60 to 1:1, and a ratio of A to B9 of 1:1,000 to 5:1, preferably 1:60 to 1:1, with B8 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha, and B9 being applied at a rate of 10 to 100 g/ha, preferably 20 to 60 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:10, preferably 1:1,000 to 1:25, with B being applied at a rate of 500 to 3,000 g/ha, preferably 500 to 1,000 g/ha. Combination 11 is generally used in a ratio of A to B of 1:50,000 to 1:10, preferably 1:2,000 to 1:25, with B being applied at a rate of 500 to 5,000 g/ha, preferably 500 to 2,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 16 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 17 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 18 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:30,000 to 1:40, preferably 1:1,000 to 1:10, with B being applied at a rate of 200 to 3,000 g/ha, preferably 200 to 1,000 g/ha.

Specifically preferred mixtures for use in soybeans are selected from the group:

a) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	chlorimuron-ethyl	2	thifensulfuron-methyl
3	chlorimuron-ethyl (B1) in combination with thifensulfuron-methyl (B2)	4	clethodim
5	sethoxydim	6	fluazifop-p-butyl
7	haloxyfop	8	imazethapyr
9	imozamox	10	imazaquin
11	glufosinate	12	glyphosate
13	glyphosate-trimesium	14	lactofen

Combination 1 is generally used in a ratio of A to B of 1:1,000 to 10:1, preferably 1:25 to 4:1, with B being applied at a rate of 5 to 100 g/ha, preferably 5 to 25 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:10 to 10:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:1,000 to 50:1, preferably 1:50 to 4:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 100 g/ha, preferably 5 to 50 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:50 to 2:1, with B being applied at a rate of 1 to 500 g/ha, preferably 10 to 50 g/ha. Combination 5 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 6 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 7 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 8 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 9 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 10 is generally used in a ratio of A to B of

1:10,000 to 1:2, preferably 1:400 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 400 g/ha. Combination 11 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 13 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 14 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha.

b) (6*S*-*cis*)-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]-*N*-[(chloromethyl)sulfonyl]acetamide (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	chlorimuron-ethyl	2	thifensulfuron-methyl
3	chlorimuron-ethyl (B1) in combination with thifensulfuron-methyl (B2)	4	clethodim
5	sethoxydim	6	fluazifop-p-butyl
7	haloxyfop	8	imazethapyr
9	imozamox	10	imazaquin
11	glufosinate	12	glyphosate
13	glyphosate-trimesium	14	lactofen

Combination 1 is generally used in a ratio of A to B of 1:1,000 to 10:1, preferably 1:25 to 4:1, with B being applied at a rate of 5 to 100 g/ha, preferably 5 to 25 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:10 to 10:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:1,000 to 50:1, preferably 1:50 to 4:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 100 g/ha, preferably 5 to 50 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:50 to 2:1, with B being applied at a rate of 1 to 500 g/ha, preferably 10 to 50 g/ha. Combination 5 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha,

preferably 50 to 200 g/ha. Combination 6 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 7 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 8 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 9 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 10 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:400 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 400 g/ha. Combination 11 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 13 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 14 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha.

c) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	chlorimuron-ethyl	2	thifensulfuron-methyl
3	chlorimuron-ethyl (B1) in combination with thifensulfuron-methyl (B2)	4	clethodim
5	sethoxydim	6	fluazifop-p-butyl
7	haloxyfop	8	imazethapyr
9	imozamox	10	imazaquin
11	glufosinate	12	glyphosate
13	glyphosate-trimesium	14	lactofen

Combination 1 is generally used in a ratio of A to B of 1:1,000 to 10:1, preferably 1:25 to 4:1, with B being applied at a rate of 5 to 100 g/ha, preferably 5 to 25 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:10 to 10:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:1,000 to 50:1, preferably 1:50 to 4:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 100 g/ha, preferably 5 to 50 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:50 to 2:1, with B being applied at a rate of 1 to 500 g/ha, preferably 10 to 50 g/ha. Combination 5 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 6 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 7 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 8 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 9 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 10 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:400 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 400 g/ha. Combination 11 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 13 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 14 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha.

d) (6*S*-*cis*)-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl)-*N*-[(chloromethyl)sulfonyl]acetamide (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	chlorimuron-ethyl	2	thifensulfuron-methyl
3	chlorimuron-ethyl (B1) in combination with thifensulfuron-methyl (B2)	4	clethodim
5	sethoxydim	6	fluazifop-p-butyl
7	haloxyfop	8	imazethapyr
9	imozamox	10	imazaquin
11	glufosinate	12	glyphosate
13	glyphosate-trimesium	14	lactofen

Combination 1 is generally used in a ratio of A to B of 1:1,000 to 10:1, preferably 1:25 to 4:1, with B being applied at a rate of 5 to 100 g/ha, preferably 5 to 25 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:10 to 10:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:1,000 to 50:1, preferably 1:50 to 4:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 100 g/ha, preferably 5 to 50 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:50 to 2:1, with B being applied at a rate of 1 to 500 g/ha, preferably 10 to 50 g/ha. Combination 5 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 6 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 7 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 8 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 9 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 10 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:400 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 400 g/ha. Combination 11 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of

100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 13 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 14 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha.

e) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide monosodium salt (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	chlorimuron-ethyl	2	thifensulfuron-methyl
3	chlorimuron-ethyl (B1) in combination with thifensulfuron-methyl (B2)	4	clethodim
5	sethoxydim	6	fluazifop-p-butyl
7	haloxyfop	8	imazethapyr
9	imozamox	10	imazaquin
11	glufosinate	12	glyphosate
13	glyphosate-trimesium	14	lactofen

Combination 1 is generally used in a ratio of A to B of 1:1,000 to 10:1, preferably 1:25 to 4:1, with B being applied at a rate of 5 to 100 g/ha, preferably 5 to 25 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:10 to 10:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:1,000 to 50:1, preferably 1:50 to 4:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 100 g/ha, preferably 5 to 50 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:50 to 2:1, with B being applied at a rate of 1 to 500 g/ha, preferably 10 to 50 g/ha. Combination 5 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 6 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 7 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 8 is generally used in a ratio of A to B of

1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 9 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 10 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:400 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 400 g/ha. Combination 11 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 13 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 14 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha.

f) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide monopotassium salt (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	chlorimuron-ethyl	2	thifensulfuron-methyl
3	chlorimuron-ethyl (B1) in combination with thifensulfuron-methyl (B2)	4	clethodim
5	sethoxydim	6	fluazifop-p-butyl
7	haloxyfop	8	imazethapyr
9	imozamox	10	imazaquin
11	glufosinate	12	glyphosate
13	glyphosate-trimesium	14	lactofen

Combination 1 is generally used in a ratio of A to B of 1:1,000 to 10:1, preferably 1:25 to 4:1, with B being applied at a rate of 5 to 100 g/ha, preferably 5 to 25 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:10 to 10:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:1,000 to 50:1, preferably 1:50 to 4:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 100 g/ha, preferably 5 to 50 g/ha, and B2 being applied at a rate

of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:50 to 2:1, with B being applied at a rate of 1 to 500 g/ha, preferably 10 to 50 g/ha. Combination 5 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 6 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 7 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 8 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 9 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 10 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:400 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 400 g/ha. Combination 11 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 13 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 14 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha.

g) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide monosodium salt (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	chlorimuron-ethyl	2	thifensulfuron-methyl
3	chlorimuron-ethyl (B1) in combination with thifensulfuron-methyl (B2)	4	clethodim
5	sethoxydim	6	fluazifop-p-butyl
7	haloxyfop	8	imazethapyr

9	imozamox	10	imazaquin
11	glufosinate	12	glyphosate
13	glyphosate-trimesium	14	lactofen

Combination 1 is generally used in a ratio of A to B of 1:1,000 to 10:1, preferably 1:25 to 4:1, with B being applied at a rate of 5 to 100 g/ha, preferably 5 to 25 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:10 to 10:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:1,000 to 50:1, preferably 1:50 to 4:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 100 g/ha, preferably 5 to 50 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:50 to 2:1, with B being applied at a rate of 1 to 500 g/ha, preferably 10 to 50 g/ha. Combination 5 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 6 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 7 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 8 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 9 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 10 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:400 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 400 g/ha. Combination 11 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 13 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 14 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha.

h) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide monopotassium salt (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	chlorimuron-ethyl	2	thifensulfuron-methyl
3	chlorimuron-ethyl (B1) in combination with thifensulfuron-methyl (B2)	4	clethodim
5	sethoxydim	6	fluazifop-p-butyl
7	haloxyfop	8	imazethapyr
9	imozamox	10	imazaquin
11	glufosinate	12	glyphosate
13	glyphosate-trimesium	14	lactofen

Combination 1 is generally used in a ratio of A to B of 1:1,000 to 10:1, preferably 1:25 to 4:1, with B being applied at a rate of 5 to 100 g/ha, preferably 5 to 25 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:10 to 10:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 10 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:1,000 to 50:1, preferably 1:50 to 4:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 100 g/ha, preferably 5 to 50 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:50 to 2:1, with B being applied at a rate of 1 to 500 g/ha, preferably 10 to 50 g/ha. Combination 5 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 6 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 7 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 8 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha. Combination 9 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 10 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:400 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 400 g/ha. Combination 11 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 12 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of

100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 13 is generally used in a ratio of A to B of 1:40,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 4,000 g/ha, preferably 200 to 1,000 g/ha. Combination 14 is generally used in a ratio of A to B of 1:5,000 to 50:1, preferably 1:200 to 1:2, with B being applied at a rate of 10 to 500 g/ha, preferably 50 to 200 g/ha.

Specifically preferred mixtures for use in winter wheat, winter barley, spring wheat, spring barley, and peas are selected from the group:

a) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	tribenuron-methyl	2	thifensulfuron-methyl
3	thifensulfuron-methyl (B1) in combination with tribenuron-methyl (B2)	4	metsulfuron-methyl
5	thifensulfuron-methyl (B3) in combination with metsulfuron-methyl (B4)	6	thifensulfuron-methyl (B5) in combination with tribenuron-methyl (B6) in combination with metsulfuron-methyl (B7)
7	chlorsulfuron	8	chlorsulfuron (B8) in combination with metsulfuron-methyl (B9)
9	triasulfuron	10	2,4-D
11	dicamba	12	bromoxynil
13	MCPA	14	bromoxynil (B10) in combination with MCPA (B11)
15	fluroxypyr	16	clopyralid
17	fenoxaprop (B12) in combination with fenchlorazole (B13)	18	diclofop
19	tralkoxydim	20	clodinafop (B14) in combination with cloquintocet-mexyl (B15)

21	imazamethabenz	22	sulfosulfuron
23	difenzoquat	24	propanil
25	prosulfuron	26	metribuzin
27	glyphosate	28	triallate
29	trifluralin		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20 to 20:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 1 to 20 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:200 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A to B3 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B4 of 1:200 to 50:1, preferably 1:20 to 20:1, with B3 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B4 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 6 is generally used in a ratio of A to B5 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B6 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B7 of 1:200 to 50:1, preferably 1:20 to 20:1, with B5 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B6 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B7 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 7 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B8 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B9 of 1:200 to 50:1, preferably 1:20 to 20:1, with B8 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B9 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 9 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 3,000 g/ha, preferably 100 to 500 g/ha. Combination 11 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 12 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B

of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B10 of 1:20,000 to 1:2, preferably 1:500 to 1:5, and ratio of A to B11 of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B10 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha, and B11 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 16 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 17 is generally used in a ratio of A to B12 of 1:5,000 to 5:1, preferably 1:500 to 1:5, and ratio of A to B13 of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B12 being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha, and B13 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 18 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 20 is generally used in a ratio of A to B14 of 1:2,000 to 5:1, preferably 1:60 to 2:1, and ratio of A to B15 of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B14 being applied at a rate of 10 to 200 g/ha, preferably 10 to 60 g/ha, and B15 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 21 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 22 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 23 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 24 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 25 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 100 g/ha, preferably 10 to 50 g/ha. Combination 26 is generally used in a ratio of A to B of 1:10,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 1,000 g/ha, preferably 10 to 100 g/ha. Combination 27 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 28 is generally used in a ratio of A to B of 1:20,000 to 1:20, preferably 1:1,500 to 1:50, with B being applied at a rate of 1,000 to 2,000 g/ha, preferably 1,000 to 1,500 g/ha. Combination 29 is generally

used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha.

b) (6*S*-*cis*)-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]-*N*-[(chloromethyl)sulfonyl]acetamide (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	tribenuron-methyl	2	thifensulfuron-methyl
3	thifensulfuron-methyl (B1) in combination with tribenuron-methyl (B2)	4	metsulfuron-methyl
5	thifensulfuron-methyl (B3) in combination with metsulfuron-methyl (B4)	6	thifensulfuron-methyl (B5) in combination with tribenuron-methyl (B6) in combination with metsulfuron-methyl (B7)
7	chlorsulfuron	8	chlorsulfuron (B8) in combination with metsulfuron-methyl (B9)
9	triasulfuron	10	2,4-D
11	dicamba	12	bromoxynil
13	MCPA	14	bromoxynil (B10) in combination with MCPA (B11)
15	fluroxypyr	16	clopyralid
17	fenoxaprop (B12) in combination with fenchlorazole (B13)	18	diclofop
19	tralkoxydim	20	clodinafop (B14) in combination with cloquintocet-mexyl (B15)
21	imazamethabenz	22	sulfosulfuron
23	difenzoquat	24	propanil
25	prosulfuron	26	metribuzin
27	glyphosate	28	triallate
29	trifluralin		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20 to 20:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 1 to 20 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:200 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A to B3 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B4 of 1:200 to 50:1, preferably 1:20 to 20:1, with B3 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B4 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 6 is generally used in a ratio of A to B5 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B6 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B7 of 1:200 to 50:1, preferably 1:20 to 20:1, with B5 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B6 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B7 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 7 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B8 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B9 of 1:200 to 50:1, preferably 1:20 to 20:1, with B8 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B9 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 9 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 3,000 g/ha, preferably 100 to 500 g/ha. Combination 11 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 12 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B10 of 1:20,000 to 1:2, preferably 1:500 to 1:5, and ratio of A to B11 of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B10 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha, and B11 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to

500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 16 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 17 is generally used in a ratio of A to B12 of 1:5,000 to 5:1, preferably 1:500 to 1:5, and ratio of A to B13 of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B12 being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha, and B13 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 18 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 20 is generally used in a ratio of A to B14 of 1:2,000 to 5:1, preferably 1:60 to 2:1, and ratio of A to B15 of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B14 being applied at a rate of 10 to 200 g/ha, preferably 10 to 60 g/ha, and B15 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 21 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 22 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 23 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 24 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 25 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 100 g/ha, preferably 10 to 50 g/ha. Combination 26 is generally used in a ratio of A to B of 1:10,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 1,000 g/ha, preferably 10 to 100 g/ha. Combination 27 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 28 is generally used in a ratio of A to B of 1:20,000 to 1:20, preferably 1:1,500 to 1:50, with B being applied at a rate of 1,000 to 2,000 g/ha, preferably 1,000 to 1,500 g/ha. Combination 29 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha.

c) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	tribenuron-methyl	2	thifensulfuron-methyl
3	thifensulfuron-methyl (B1) in combination with tribenuron-methyl (B2)	4	metsulfuron-methyl
5	thifensulfuron-methyl (B3) in combination with metsulfuron-methyl (B4)	6	thifensulfuron-methyl (B5) in combination with tribenuron-methyl (B6) in combination with metsulfuron-methyl (B7)
7	chlorsulfuron	8	chlorsulfuron (B8) in combination with metsulfuron-methyl (B9)
9	triasulfuron	10	2,4-D
11	dicamba	12	bromoxynil
13	MCPA	14	bromoxynil (B10) in combination with MCPA (B11)
15	fluroxypyr	16	clopyralid
17	fenoxaprop (B12) in combination with fenchlorazole (B13)	18	diclofop
19	tralkoxydim	20	clodinafop (B14) in combination with cloquintocet-mexyl (B15)
21	imazamethabenz	22	sulfosulfuron
23	difenzoquat	24	propanil
25	prosulfuron	26	metribuzin
27	glyphosate	28	triallate
29	trifluralin		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20

to 20:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 1 to 20 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:200 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A to B3 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B4 of 1:200 to 50:1, preferably 1:20 to 20:1, with B3 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B4 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 6 is generally used in a ratio of A to B5 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B6 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B7 of 1:200 to 50:1, preferably 1:20 to 20:1, with B5 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B6 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B7 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 7 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B8 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B9 of 1:200 to 50:1, preferably 1:20 to 20:1, with B8 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B9 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 9 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 3,000 g/ha, preferably 100 to 500 g/ha. Combination 11 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 12 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B10 of 1:20,000 to 1:2, preferably 1:500 to 1:5, and ratio of A to B11 of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B10 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha, and B11 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 16 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 17 is generally used in a ratio of A to B12 of 1:5,000 to 5:1, preferably 1:500 to 1:5, and ratio of A to B13 of 1:1,000 to 50:1, preferably 1:20 to

20:1, with B12 being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha, and B13 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 18 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 20 is generally used in a ratio of A to B14 of 1:2,000 to 5:1, preferably 1:60 to 2:1, and ratio of A to B15 of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B14 being applied at a rate of 10 to 200 g/ha, preferably 10 to 60 g/ha, and B15 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 21 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 22 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 23 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 24 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 25 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 100 g/ha, preferably 10 to 50 g/ha. Combination 26 is generally used in a ratio of A to B of 1:10,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 1,000 g/ha, preferably 10 to 100 g/ha. Combination 27 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 28 is generally used in a ratio of A to B of 1:20,000 to 1:20, preferably 1:1,500 to 1:50, with B being applied at a rate of 1,000 to 2,000 g/ha, preferably 1,000 to 1,500 g/ha. Combination 29 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha.

d) (6*S*-*cis*)-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl)-*N*-[(chloromethyl)sulfonyl]acetamide (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	tribenuron-methyl	2	thifensulfuron-methyl
3	thifensulfuron-methyl (B1) in combination with tribenuron-methyl (B2)	4	metsulfuron-methyl
5	thifensulfuron-methyl (B3) in combination with metsulfuron-methyl (B4)	6	thifensulfuron-methyl (B5) in combination with tribenuron-methyl (B6) in combination with metsulfuron-methyl (B7)
7	chlorsulfuron	8	chlorsulfuron (B8) in combination with metsulfuron-methyl (B9)
9	triasulfuron	10	2,4-D
11	dicamba	12	bromoxynil
13	MCPA	14	bromoxynil (B10) in combination with MCPA (B11)
15	fluroxypyr	16	clopyralid
17	fenoxaprop (B12) in combination with fenchlorazole (B13)	18	diclofop
19	tralkoxydim	20	clodinafop (B14) in combination with cloquintocet-mexyl (B15)
21	imazamethabenz	22	sulfosulfuron
23	difenzoquat	24	propanil
25	prosulfuron	26	metribuzin
27	glyphosate	28	triallate
29	trifluralin		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20

to 20:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 1 to 20 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:200 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A to B3 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B4 of 1:200 to 50:1, preferably 1:20 to 20:1, with B3 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B4 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 6 is generally used in a ratio of A to B5 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B6 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B7 of 1:200 to 50:1, preferably 1:20 to 20:1, with B5 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B6 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B7 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 7 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B8 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B9 of 1:200 to 50:1, preferably 1:20 to 20:1, with B8 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B9 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 9 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 3,000 g/ha, preferably 100 to 500 g/ha. Combination 11 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 12 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B10 of 1:20,000 to 1:2, preferably 1:500 to 1:5, and ratio of A to B11 of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B10 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha, and B11 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 16 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 17 is generally used in a ratio of A to B12 of 1:5,000 to 5:1, preferably 1:500 to 1:5, and ratio of A to B13 of 1:1,000 to 50:1, preferably 1:20 to

20:1, with B12 being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha, and B13 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 18 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 20 is generally used in a ratio of A to B14 of 1:2,000 to 5:1, preferably 1:60 to 2:1, and ratio of A to B15 of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B14 being applied at a rate of 10 to 200 g/ha, preferably 10 to 60 g/ha, and B15 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 21 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 22 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 23 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 24 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 25 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 100 g/ha, preferably 10 to 50 g/ha. Combination 26 is generally used in a ratio of A to B of 1:10,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 1,000 g/ha, preferably 10 to 100 g/ha. Combination 27 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 28 is generally used in a ratio of A to B of 1:20,000 to 1:20, preferably 1:1,500 to 1:50, with B being applied at a rate of 1,000 to 2,000 g/ha, preferably 1,000 to 1,500 g/ha. Combination 29 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha.

e) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide monosodium salt (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	tribenuron-methyl	2	thifensulfuron-methyl
3	thifensulfuron-methyl (B1) in combination with tribenuron-methyl (B2)	4	metsulfuron-methyl
5	thifensulfuron-methyl (B3) in combination with metsulfuron-methyl (B4)	6	thifensulfuron-methyl (B5) in combination with tribenuron-methyl (B6) in combination with metsulfuron-methyl (B7)
7	chlorsulfuron	8	chlorsulfuron (B8) in combination with metsulfuron-methyl (B9)
9	triasulfuron	10	2,4-D
11	dicamba	12	bromoxynil
13	MCPA	14	bromoxynil (B10) in combination with MCPA (B11)
15	fluroxypyr	16	clopyralid
17	fenoxaprop (B12) in combination with fenchlorazole (B13)	18	diclofop
19	tralkoxydim	20	clodinafop (B14) in combination with cloquintocet-mexyl (B15)
21	imazamethabenz	22	sulfosulfuron
23	difenzoquat	24	propanil
25	prosulfuron	26	metribuzin
27	glyphosate	28	triallate
29	trifluralin		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20

to 20:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 1 to 20 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:200 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A to B3 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B4 of 1:200 to 50:1, preferably 1:20 to 20:1, with B3 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B4 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 6 is generally used in a ratio of A to B5 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B6 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B7 of 1:200 to 50:1, preferably 1:20 to 20:1, with B5 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B6 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B7 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 7 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B8 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B9 of 1:200 to 50:1, preferably 1:20 to 20:1, with B8 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B9 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 9 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 3,000 g/ha, preferably 100 to 500 g/ha. Combination 11 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 12 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B10 of 1:20,000 to 1:2, preferably 1:500 to 1:5, and ratio of A to B11 of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B10 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha, and B11 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 16 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 17 is generally used in a ratio of A to B12 of 1:5,000 to 5:1, preferably 1:500 to 1:5, and ratio of A to B13 of 1:1,000 to 50:1, preferably 1:20 to

20:1, with B12 being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha, and B13 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 18 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 20 is generally used in a ratio of A to B14 of 1:2,000 to 5:1, preferably 1:60 to 2:1, and ratio of A to B15 of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B14 being applied at a rate of 10 to 200 g/ha, preferably 10 to 60 g/ha, and B15 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 21 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 22 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 23 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 24 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 25 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 100 g/ha, preferably 10 to 50 g/ha. Combination 26 is generally used in a ratio of A to B of 1:10,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 1,000 g/ha, preferably 10 to 100 g/ha. Combination 27 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 28 is generally used in a ratio of A to B of 1:20,000 to 1:20, preferably 1:1,500 to 1:50, with B being applied at a rate of 1,000 to 2,000 g/ha, preferably 1,000 to 1,500 g/ha. Combination 29 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha.

f) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide monopotassium salt (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	tribenuron-methyl	2	thifensulfuron-methyl
3	thifensulfuron-methyl (B1) in combination with tribenuron-methyl (B2)	4	metsulfuron-methyl
5	thifensulfuron-methyl (B3) in combination with metsulfuron-methyl (B4)	6	thifensulfuron-methyl (B5) in combination with tribenuron-methyl (B6) in combination with metsulfuron-methyl (B7)
7	chlorsulfuron	8	chlorsulfuron (B8) in combination with metsulfuron-methyl (B9)
9	triasulfuron	10	2,4-D
11	dicamba	12	bromoxynil
13	MCPA	14	bromoxynil (B10) in combination with MCPA (B11)
15	fluroxypyr	16	clopyralid
17	fenoxaprop (B12) in combination with fenchlorazole (B13)	18	diclofop
19	tralkoxydim	20	clodinafop (B14) in combination with cloquintocet-mexyl (B15)
21	imazamethabenz	22	sulfosulfuron
23	difenzoquat	24	propanil
25	prosulfuron	26	metribuzin
27	glyphosate	28	triallate
29	trifluralin		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20

to 20:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 1 to 20 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:200 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A to B3 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B4 of 1:200 to 50:1, preferably 1:20 to 20:1, with B3 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B4 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 6 is generally used in a ratio of A to B5 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B6 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B7 of 1:200 to 50:1, preferably 1:20 to 20:1, with B5 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B6 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B7 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 7 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B8 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B9 of 1:200 to 50:1, preferably 1:20 to 20:1, with B8 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B9 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 9 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 3,000 g/ha, preferably 100 to 500 g/ha. Combination 11 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 12 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B10 of 1:20,000 to 1:2, preferably 1:500 to 1:5, and ratio of A to B11 of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B10 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha, and B11 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 16 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 17 is generally used in a ratio of A to B12 of 1:5,000 to 5:1, preferably 1:500 to 1:5, and ratio of A to B13 of 1:1,000 to 50:1, preferably 1:20 to

20:1, with B12 being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha, and B13 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 18 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 20 is generally used in a ratio of A to B14 of 1:2,000 to 5:1, preferably 1:60 to 2:1, and ratio of A to B15 of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B14 being applied at a rate of 10 to 200 g/ha, preferably 10 to 60 g/ha, and B15 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 21 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 22 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 23 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 24 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 25 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 100 g/ha, preferably 10 to 50 g/ha. Combination 26 is generally used in a ratio of A to B of 1:10,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 1,000 g/ha, preferably 10 to 100 g/ha. Combination 27 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 28 is generally used in a ratio of A to B of 1:20,000 to 1:20, preferably 1:1,500 to 1:50, with B being applied at a rate of 1,000 to 2,000 g/ha, preferably 1,000 to 1,500 g/ha. Combination 29 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha.

g) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide monosodium salt (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
1	tribenuron-methyl	2	thifensulfuron-methyl
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5	thifensulfuron-methyl (B3) in combination with metsulfuron-methyl (B4)	6	thifensulfuron-methyl (B5) in combination with tribenuron-methyl (B6) in combination with metsulfuron-methyl (B7)
7	chlorsulfuron	8	chlorsulfuron (B8) in combination with metsulfuron-methyl (B9)
9	triasulfuron	10	2,4-D
11	dicamba	12	bromoxynil
13	MCPA	14	bromoxynil (B10) in combination with MCPA (B11)
15	fluroxypyr	16	clopyralid
17	fenoxaprop (B12) in combination with fenchlorazole (B13)	18	diclofop
19	tralkoxydim	20	clodinafop (B14) in combination with cloquintocet-mexyl (B15)
21	imazamethabenz	22	sulfosulfuron
23	difenzoquat	24	propanil
25	prosulfuron	26	metribuzin
27	glyphosate	28	triallate
29	trifluralin		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20

to 20:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 1 to 20 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:200 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A to B3 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B4 of 1:200 to 50:1, preferably 1:20 to 20:1, with B3 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B4 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 6 is generally used in a ratio of A to B5 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B6 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B7 of 1:200 to 50:1, preferably 1:20 to 20:1, with B5 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B6 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B7 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 7 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B8 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B9 of 1:200 to 50:1, preferably 1:20 to 20:1, with B8 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B9 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 9 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 3,000 g/ha, preferably 100 to 500 g/ha. Combination 11 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 12 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B10 of 1:20,000 to 1:2, preferably 1:500 to 1:5, and ratio of A to B11 of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B10 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha, and B11 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 16 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 17 is generally used in a ratio of A to B12 of 1:5,000 to 5:1, preferably 1:500 to 1:5, and ratio of A to B13 of 1:1,000 to 50:1, preferably 1:20 to

20:1, with B12 being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha, and B13 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 18 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 20 is generally used in a ratio of A to B14 of 1:2,000 to 5:1, preferably 1:60 to 2:1, and ratio of A to B15 of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B14 being applied at a rate of 10 to 200 g/ha, preferably 10 to 60 g/ha, and B15 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 21 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 22 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 23 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 24 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 25 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 100 g/ha, preferably 10 to 50 g/ha. Combination 26 is generally used in a ratio of A to B of 1:10,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 1,000 g/ha, preferably 10 to 100 g/ha. Combination 27 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 28 is generally used in a ratio of A to B of 1:20,000 to 1:20, preferably 1:1,500 to 1:50, with B being applied at a rate of 1,000 to 2,000 g/ha, preferably 1,000 to 1,500 g/ha. Combination 29 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha.

h) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide monopotassium salt (mixture partner A, generally applied at a rate of 0.1 to 50 g/ha, preferably applied at a rate of 1 to 20 g/ha) in combination with:

Combination Number	Mixture partner B	Combination Number	Mixture partner B
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9	triasulfuron	10	2,4-D
11	dicamba	12	bromoxynil
13	MCPA	14	bromoxynil (B10) in combination with MCPA (B11)
15	fluroxypyr	16	clopyralid
17	fenoxaprop (B12) in combination with fenchlorazole (B13)	18	diclofop
19	tralkoxydim	20	clodinafop (B14) in combination with cloquintocet-mexyl (B15)
21	imazamethabenz	22	sulfosulfuron
23	difenzoquat	24	propanil
25	prosulfuron	26	metribuzin
27	glyphosate	28	triallate
29	trifluralin		

Combination 1 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 2 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 3 is generally used in a ratio of A to B1 of 1:500 to 50:1, preferably 1:20

to 20:1, and ratio of A to B2 of 1:500 to 50:1, preferably 1:10 to 20:1, with B1 being applied at a rate of 1 to 50 g/ha, preferably 1 to 20 g/ha, and B2 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 4 is generally used in a ratio of A to B of 1:200 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 5 is generally used in a ratio of A to B3 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B4 of 1:200 to 50:1, preferably 1:20 to 20:1, with B3 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B4 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 6 is generally used in a ratio of A to B5 of 1:1,000 to 50:1, preferably 1:20 to 20:1, and ratio of A to B6 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B7 of 1:200 to 50:1, preferably 1:20 to 20:1, with B5 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha, and B6 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B7 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 7 is generally used in a ratio of A to B of 1:500 to 50:1, preferably 1:10 to 20:1, with B being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha. Combination 8 is generally used in a ratio of A to B8 of 1:500 to 50:1, preferably 1:10 to 20:1, and ratio of A to B9 of 1:200 to 50:1, preferably 1:20 to 20:1, with B8 being applied at a rate of 1 to 50 g/ha, preferably 1 to 10 g/ha, and B9 being applied at a rate of 1 to 20 g/ha, preferably 1 to 10 g/ha. Combination 9 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 10 is generally used in a ratio of A to B of 1:30,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 3,000 g/ha, preferably 100 to 500 g/ha. Combination 11 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 12 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 13 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 14 is generally used in a ratio of A to B10 of 1:20,000 to 1:2, preferably 1:500 to 1:5, and ratio of A to B11 of 1:20,000 to 1:2, preferably 1:500 to 1:5, with B10 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha, and B11 being applied at a rate of 100 to 2,000 g/ha, preferably 100 to 500 g/ha. Combination 15 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 16 is generally used in a ratio of A to B of 1:5,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha. Combination 17 is generally used in a ratio of A to B12 of 1:5,000 to 5:1, preferably 1:500 to 1:5, and ratio of A to B13 of 1:1,000 to 50:1, preferably 1:20 to

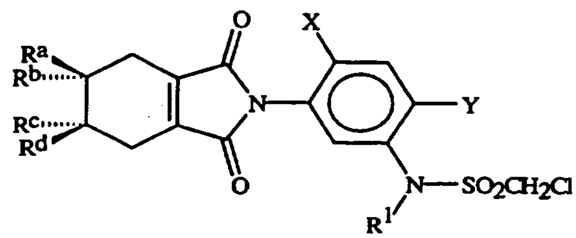
20:1, with B12 being applied at a rate of 10 to 500 g/ha, preferably 10 to 100 g/ha, and B13 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 18 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 19 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 20 is generally used in a ratio of A to B14 of 1:2,000 to 5:1, preferably 1:60 to 2:1, and ratio of A to B15 of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B14 being applied at a rate of 10 to 200 g/ha, preferably 10 to 60 g/ha, and B15 being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 21 is generally used in a ratio of A to B of 1:10,000 to 1:2, preferably 1:300 to 1:5, with B being applied at a rate of 100 to 1,000 g/ha, preferably 100 to 300 g/ha. Combination 22 is generally used in a ratio of A to B of 1:1,000 to 50:1, preferably 1:20 to 20:1, with B being applied at a rate of 1 to 100 g/ha, preferably 1 to 20 g/ha. Combination 23 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 24 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 25 is generally used in a ratio of A to B of 1:1,000 to 5:1, preferably 1:50 to 2:1, with B being applied at a rate of 10 to 100 g/ha, preferably 10 to 50 g/ha. Combination 26 is generally used in a ratio of A to B of 1:10,000 to 5:1, preferably 1:100 to 2:1, with B being applied at a rate of 10 to 1,000 g/ha, preferably 10 to 100 g/ha. Combination 27 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha. Combination 28 is generally used in a ratio of A to B of 1:20,000 to 1:20, preferably 1:1,500 to 1:50, with B being applied at a rate of 1,000 to 2,000 g/ha, preferably 1,000 to 1,500 g/ha. Combination 29 is generally used in a ratio of A to B of 1:20,000 to 1:2, preferably 1:1,000 to 1:10, with B being applied at a rate of 100 to 2,000 g/ha, preferably 200 to 1,000 g/ha.

A herbicidally effective amount of the compounds of this invention is determined by a number of factors. These factors include: formulation selected, method of application, amount and type of vegetation present, growing conditions, etc. In general, a herbicidally effective amount of compounds of this invention is 0.001 to 20 kg/ha with a preferred range of 0.001 to 1.0 kg/ha. One skilled in the art can easily determine the herbicidally effective amount necessary for the desired level of weed control.

The following Tests demonstrate the control efficacy of the compounds of this invention against specific weeds. The weed control afforded by the compounds is not limited, however, to these species. See Index Tables A-K for compound descriptions. The following abbreviation is used in the Index Tables which follow: CN = cyano. The

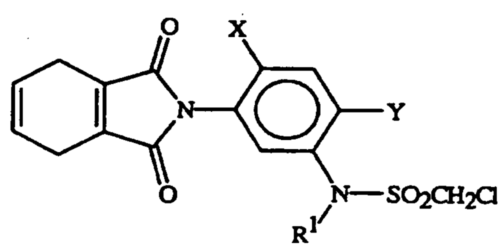
abbreviation "dec" indicates that the compound appeared to decompose on melting. The abbreviation "Ex." stands for "Example" and is followed by a number indicating in which example the compound is prepared.

Index Table A



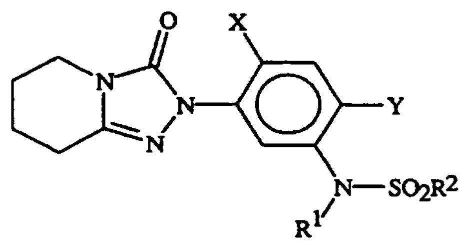
Cmpd	R^a	R^b	R^c	R^d	X	Y	R^1	m.p. (°C)
1	H	H	H	H	F	Cl	H	136-139
2	H	H	H	H	F	Cl	$CH_2C{\equiv}CH$	*
3	H	H	H	H	F	Cl	SO_2CH_2Cl	213-216
4	H	H	H	H	F	Cl	$C(O)CH(CH_3)_2$	185
5	H	H	H	H	F	Cl	$C(O)CH_3$	200
6	Br	OH	H	H	F	Cl	H	169-172
7	Br	Br	H	H	F	Cl	H	218-219
8	Br	F	H	H	F	Cl	H	202-205

Index Table B



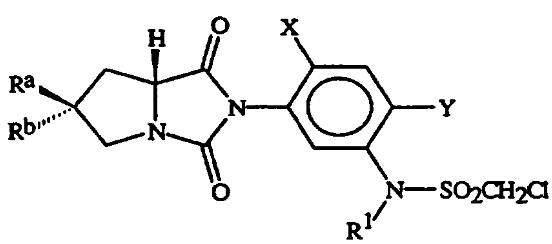
Cmpd	X	Y	R^1	m.p. (°C)
9	F	Cl	H	173-176
10	F	Cl	SO_2CH_2Cl	210-214

Index Table C



Cmpd	X	Y	R^1	R^2	m.p. (°C)
11	Cl	Cl	H	CH_2Cl	209-211
12	Cl	Cl	$C(O)CH_3$	CH_2Cl	89-90
13	Cl	Cl	$CH_2C\equiv CH$	CH_2Cl	78-80
14	Cl	Cl	$C(O)CH_2Cl$	CH_2Cl	204-206
15	Cl	Cl	H	CF_3	*
16	Cl	Cl	$SO_2CH_2CH_2CH_2Cl$	$CH_2CH_2CH_2Cl$	148-152
17	Cl	Cl	H	$CH_2CH_2CH_2Cl$	192-194
18	Cl	Cl	H	$CH=CH_2$	*
19	Cl	Cl	SO_2 $CH=CH_2$	$CH=CH_2$	*

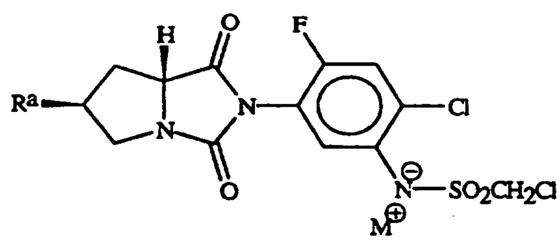
Index Table D

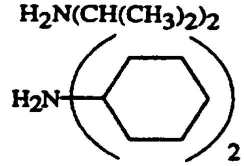


Cmpd	R^a	R^b	X	Y	R^1	m.p. (°C)
20	F	H	F	Cl	$CH_2C\equiv CH$	*
21 (Ex. 1)	F	H	F	Cl	H	169-170*
22	F	H	F	Cl	SO_2CH_2Cl	200 (dec)
23 (Ex. 3)	F	H	F	Cl	$C(O)CH_3$	198-200
24	Cl	H	F	Cl	SO_2CH_2Cl	*
25 (Ex. 2)	Cl	H	F	Cl	H	169-170
26	H	H	F	Cl	H	72-74
27	H	H	F	Cl	SO_2CH_2Cl	216-217

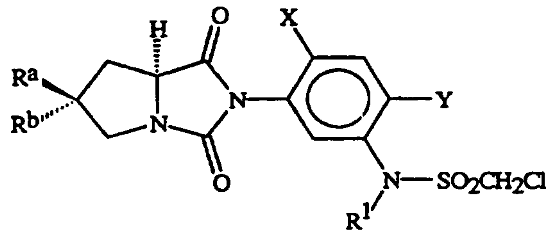
28	H	H	Cl	Cl	H	216
29	H	H	Cl	Cl	SO_2CH_2Cl	196
30	F	H	Cl	Cl	H	205
31 (Ex. 8)	Cl	H	F	Cl	CH_3	120-124
32 (Ex. 4)	Cl	H	F	Cl	$C(O)CH_3$	180-181
33 (Ex. 9)	Cl	H	F	Cl	CH_2CH_3	152-154
34 (Ex. 6)	F	H	F	Cl	CH_2CH_3	198-200
35 (Ex. 5)	F	H	F	Cl	CH_3	90-92
36 (Ex. 10)	Cl	H	F	Cl	CO_2CH_3	117-124
37 (Ex. 7)	F	H	F	Cl	CO_2CH_3	108-115
38	H	OH	F	Cl	H	207-209

Index Table E



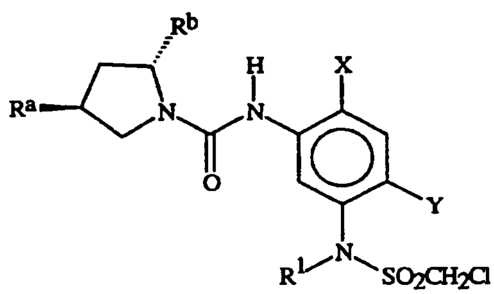
Cmpd	$M^{\oplus}$	R^a	m.p. (°C)
39	Na	F	198-200
40	$HN(CH_2CH_3)_3$	F	73-76
41	K	F	194-196
42	Li	F	208-217
43	$HN(CH_2CH_2OH)_3$	F	55-57
44	$H_2N(CH(CH_3)_2)_2$	F	76-80
45		Cl	160-162

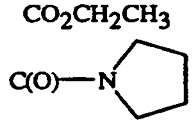
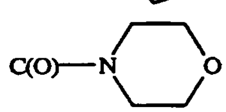
Index Table F

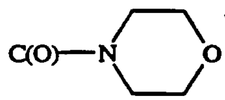
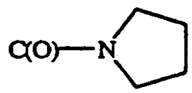


Cmpd	R^a	R^b	X	Y	R^1	m.p. (°C)
46	F	H	F	Cl	H	170-172
47	F	H	F	Cl	SO_2CH_2Cl	110-111
48	Cl	H	F	Cl	H	*
49	H	F	F	Cl	H	78 (dec)
50	H	F	F	Cl	SO_2CH_2Cl	201-203 (dec)
51	Cl	H	F	Cl	SO_2CH_2Cl	140-142

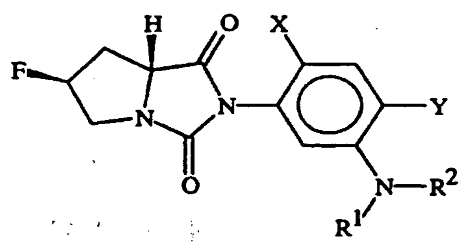
Index Table G



Cmpd	R^a	R^b	X	Y	R^1	m.p. (°C)
52	F	CO_2CH_3	F	Cl	H	77 (dec)
53	Cl	CO_2CH_3	F	Cl	H	145-150
54	F	$CO_2CH_2CH_3$	F	Cl	H	*
55	Cl	$CO_2CH_2CH_3$	F	Cl	H	*
56	F		F	Cl	H	129-130
57	F		F	Cl	H	108-110
58	Cl	CO_2CH_3	F	Cl	$C(O)CH_3$	115-118

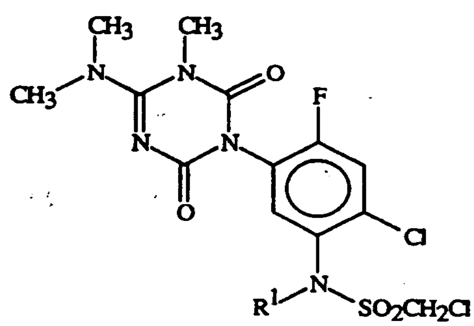
59	F	CO_2CH_3	F	Cl	CH_3	76-77 (dec)
60	F	C(O)NHOCH_3	F	Cl	H	160 (dec)
61	Cl	C(O)NHOCH_3	F	Cl	H	66-70
62	Cl		F	Cl	H	68-72
63	Cl		F	Cl	H	80

Index Table H



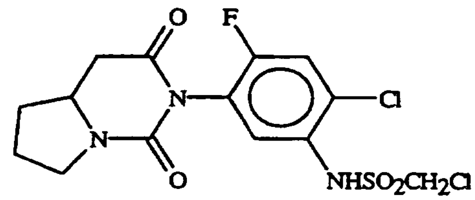
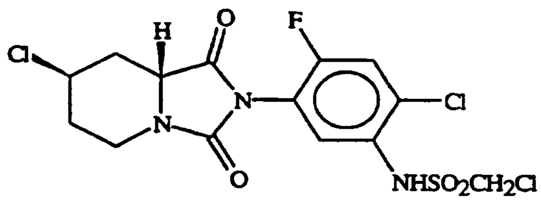
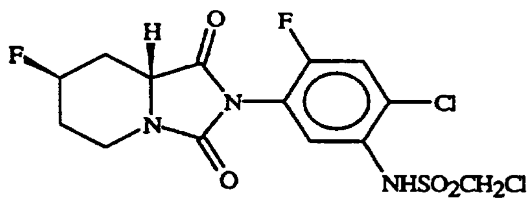
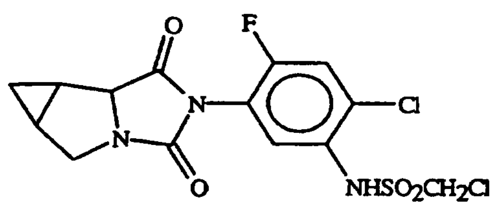
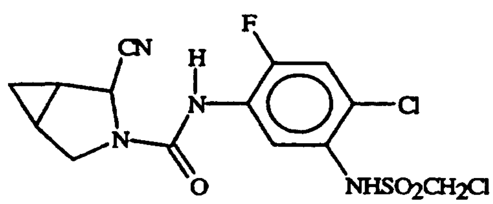
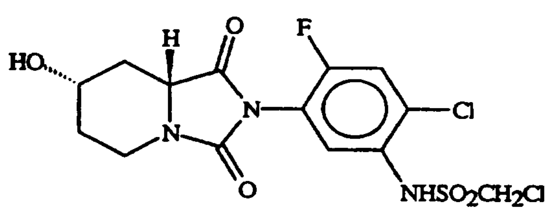
Cmpd	X	Y	R1	R2	m.p. (°C)
64	F	Cl	H	SO_2CH_2Br	60-65 (dec)
65	F	Cl	H	$SO_2CH_2SO_2CH_3$	90-95 (dec)

Index Table I



Cmpd	R1	m.p. (°C)
66 (Ex. 13)	H	234-237
67	SO_2CH_2Cl	144-147

Index Table J

Cmpd	Structure	m.p. (°C)
68		98-100
69		*
70 (Ex. 12)		60-64
71		89-94
72		94-98
73 (Ex. 11)		*

*See Index Table K for ^{1}H NMR data.

Index Table K

Cmpd No.	^1H NMR Data ($CDCl_3$ solution unless indicated otherwise)[a]
2	δ 7.56 (d, 1H), 7.40 (d, 1H), 4.68 (m, 1H), 4.66 (s, 2H), 4.29 (m, 1H), 2.44 (m, 4H), 1.84 (m, 4H).
15	δ 7.83 (s, 1H), 7.54 (s, 1H), 6.96 (s, 1H), 3.70 (m, 2H), 3.31 (quintet, 1H), 2.78 (t, 2H), 2.01 (m, 4H), 1.39 (d, 6H).
18	(DMSO-d_6) δ 10.05 (s, 1H), 7.92 (d, 1H), 7.47 (d, 1H), 6.96 (ddd, 1H), 6.05 (dd, 2H), 3.57 (t, 2H), 2.68 (t, 2H), 1.78-1.99 (m, 4H).
19	(DMSO-d_6) δ 8.14 (s, 1H), 7.68 (s, 1H), 7.25 (dd, 2H), 6.45 (dd, 2H), 6.35 (dd, 2H), 3.56 (m, 2H), 2.69 (t, 2H), 1.89 (m, 2H), 1.81 (m, 2H).
20	δ 7.9-7.7 (m, 2H), 5.7-5.5 (m, 1H), 4.7 (dd, 1H), 4.5 (s, 2H), 3.4 (s, 1H), 3.5-3.3 (m, 2H), 2.5-2.1 (m, 2H).
21	δ 7.62 (d, 1H), 7.34 (d, 1H), 7.26 (br s, 1H), 5.5 (m, 1H), 4.60 (dd, 1H), 4.52 (s, 2H), 4.12 (m, 1H), 3.62 (dd, 1H), 2.64 (m, 1H), 2.06 (m, 1H).
24	δ 7.78 (d, 1H), 7.42 (d, 1H), 5.31 (dd, 2H), 4.90 (dd, 2H), 4.79 (m, 2H), 4.22 (dd, 1H), 3.62 (dd, 1H), 2.60 (m, 1H), 2.32 (m, 1H).
48	δ 7.70 (d, 1H), 7.38 (d, 1H), 7.08 (br s, 1H), 4.56 (br s, 3H), 4.42 (dd, 1H), 4.30 (d, 1H), 3.52 (dd, 1H), 2.36 (m, 2H).
54	δ 8.42 (d, 1H), 7.18 (d, 1H), 6.96 (br s, 1H), 5.32 (m, 1H), 4.58 (s, 2H), 4.22 (q, 2H), 4.06 (m, 3H), 2.46 (m, 2H).
55	δ 8.42 (d, 1H), 7.21 (d, 1H), 7.0 (br s, 1H), 4.64 (t, 1H), 4.60 (s, 2H), 4.58 (m, 1H), 4.24 (q, 2H), 3.92 (m, 2H), 2.60 (m, 2H).
69	δ 7.65 (d, 1H), 7.35 (d, 1H), 4.70 (br s, 1H), 4.55 (s, 3H), 4.10-4.00 (m, 1H), 3.5-3.35 (m, 1H), 2.6-2.5 (br d, 1H), 2.1 (m, 3H).
73	(DMSO-d_6) δ 10.1 (br s, 1H), 7.75 (m, 1H), 7.4 (dd, 1H), 5.1 (m, 1H), 4.9 (s, 2H), 4.1-3.9 (m, 3H), 3.75 (m, 1H), 2.95 (m, 1H), 2.05 (m, 1H), 1.9 (br d, 1H), 1.2 (m, 1H).

[a] ^1H NMR data are in ppm downfield from tetramethylsilane. Couplings are designated by (s)-singlet, (d)-doublet, (t)-triplet, (q)-quartet, (m)-multiplet, (dd)-doublet of doublets, (ddd)-doublet of doublet of doublets, (dt)-doublet of triplets, (br s)-broad singlet.

BIOLOGICAL EXAMPLES OF THE INVENTION

TEST A

Seeds of barnyardgrass (*Echinochloa crus-galli*), cocklebur (*Xanthium strumarium*), crabgrass (*Digitaria spp.*), downy brome (*Bromus tectorum*), giant foxtail (*Setaria faberii*), morningglory (*Ipomoea spp.*), sorghum (*Sorghum bicolor*), velvetleaf (*Abutilon theophrasti*), and wild oat (*Avena fatua*) were planted into a sandy loam soil and treated preemergence by soil drench (PDRN), with test chemicals formulated in a non-phytotoxic solvent mixture which included a surfactant. At the same time, these crop and weed species were also treated postemergence sprayed to runoff (STRO), with test chemicals formulated in the sam0 manner.

Plants ranged in height from two to eighteen cm and were in the two to three leaf stage for the postemergence treatment. Treated plants and untreated controls were maintained in a greenhouse for approximately eleven days, after which all treated plants were compared to untreated controls and visually evaluated for injury. Plant response ratings, summarized in Table A, are based on a 0 to 10 scale where 0 is no effect and 10 is complete control. A dash (-) response means no test results.

Table A	COMPOUND			
Rate 2000 g/ha	45	50	59	68
PDRN				
Barnyardgrass	10	10	10	9
Cocklebur	10	10	10	10
Crabgrass	10	9	10	8
Downy brome	7	8	9	2
Giant foxtail	10	10	10	9
Morningglory	10	10	10	10
Sorghum	5	3	10	0
Velvetleaf	10	10	10	10
Wild oats	9	9	9	9

Table A	COMPOUND			
Rate 1000 g/ha	45	50	59	68
STRO				
Barnyardgrass	10	10	10	8
Cocklebur	10	10	10	10
Crabgrass	6	8	9	3
Downy brome	4	10	8	3
Giant foxtail	7	7	9	3
Morningglory	10	10	10	10
Sorghum	6	5	7	3
Velvetleaf	10	10	10	10
Wild oats	5	9	5	2

TEST B

Seeds of barley (*Hordeum vulgare*), barnyardgrass (*Echinochloa crus-galli*), bedstraw (*Galium aparine*), blackgrass (*Alopecurus myosuroides*), chickweed (*Stellaria media*), cocklebur (*Xanthium strumarium*), corn (*Zea mays*), cotton (*Gossypium hirsutum*), crabgrass (*Digitaria sanguinalis*), downy brome (*Bromus tectorum*), giant foxtail (*Setaria faberii*), lambsquarters (*Chenopodium album*), morningglory (*Ipomoea hederacea*), rape (*Brassica napus*), rice (*Oryza sativa*), sorghum (*Sorghum bicolor*), soybean (*Glycine max*), sugar beet (*Beta vulgaris*), velvetleaf (*Abutilon theophrasti*), wheat (*Triticum aestivum*), wild buckwheat (*Polygonum convolvulus*), wild oat (*Avena fatua*) and purple nutsedge (*Cyperus rotundus*) tubers were planted and treated preemergence with test chemicals formulated in a non-phytotoxic solvent mixture which included a surfactant.

At the same time, these crop and weed species were also treated with postemergence applications of test chemicals formulated in the same manner. Plants ranged in height from two to eighteen cm (one to four leaf stage) for postemergence treatments. Treated plants and controls were maintained in a greenhouse for twelve to sixteen days, after which all species were compared to controls and visually evaluated. Plant response ratings, summarized in Table B, are based on a scale of 0 to 10 where 0 is no effect and 10 is complete control. A dash (-) response means no test result.

Table B	COMPOUND
Rate 1000 g/ha	1
POSTEMERGENCE	
Barley	3
Barnyardgrass	9
Bedstraw	7
Blackgrass	3
Chickweed	6
Cocklebur	10
Corn	7
Cotton	10
Crabgrass	2
Downy brome	2
Giant foxtail	3
Lambsquarter	8
Morningglory	10
Nutsedge	3
Rape	10
Rice	5
Sorghum	3
Soybean	9
Sugar beet	10
Velvetleaf	10
Wheat	3
Wild buckwheat	10
Wild oat	2

Table B	COMPOUND
Rate 1000 g/ha	1
PREEMERGENCE	
Barley	0
Barnyardgrass	6
Bedstraw	10
Blackgrass	1
Chickweed	8
Cocklebur	8
Corn	0
Cotton	10
Crabgrass	3
Downy brome	2
Giant foxtail	10
Lambsquarter	10
Morningglory	6
Nutsedge	0
Rape	10
Rice	1
Sorghum	0
Soybean	1
Sugar beet	9
Velvetleaf	10
Wheat	0
Wild buckwheat	7
Wild oat	2

Table B	COMPOUND								
Rate 400 g/ha	6	7	8	9	10	38	66	67	70
POSTEMERGENCE									
Barley	3	3	3	3	3	0	1	1	4
Barnyardgrass	4	9	9	10	3	1	4	2	10
Bedstraw	10	-	9	10	10	2	7	3	10
Blackgrass	4	4	3	4	3	1	5	2	8
Chickweed	9	10	10	9	10	3	3	2	10
Cocklebur	7	10	9	10	10	1	3	2	10
Corn	2	2	1	5	1	1	2	1	7
Cotton	10	10	10	10	10	4	9	4	10
Crabgrass	1	2	2	3	3	1	2	1	4
Downy brome	3	5	4	3	3	1	4	2	4
Giant foxtail	3	2	2	3	2	2	6	2	6
Lambsquarter	7	9	10	9	9	3	4	4	10
Morningglory	5	10	10	10	10	3	2	3	10
Nutsedge	2	4	3	3	2	0	1	0	4
Rape	8	10	10	10	10	0	7	4	10
Rice	3	4	4	3	3	0	8	2	8
Sorghum	2	2	2	2	2	1	2	2	7
Soybean	3	5	4	6	7	1	6	4	7
Sugar beet	7	10	10	10	9	1	6	2	10
Velvetleaf	10	10	10	10	10	1	9	2	10
Wheat	3	2	3	3	2	0	9	4	8
Wild buckwheat	5	10	10	10	10	2	1	2	10
Wild oat	3	4	4	4	3	1	3	1	3

Table B	COMPOUND								
Rate 400 g/ha	6	7	8	9	10	38	66	67	70
PREEMERGENCE									
Barley	0	0	0	0	0	0	0	0	0
Barnyardgrass	0	0	0	2	0	0	6	0	9
Bedstraw	-	9	3	8	10	0	-	3	10
Blackgrass	0	0	2	0	2	1	3	1	4
Chickweed	4	10	9	10	10	-	-	4	10
Cocklebur	2	7	3	10	7	0	4	0	10
Corn	0	0	0	0	0	0	0	0	0
Cotton	0	6	0	6	0	0	0	0	10
Crabgrass	0	0	0	0	2	0	0	0	0
Downy brome	0	1	3	0	1	0	3	0	2
Giant foxtail	0	0	0	0	0	0	4	0	0
Lambsquarter	5	10	9	10	10	0	0	0	10
Morningglory	3	10	2	9	10	0	7	0	10
Nutsedge	0	0	0	0	0	0	0	0	10
Rape	0	10	10	8	6	3	0	0	10
Rice	0	0	2	0	0	0	4	0	8
Sorghum	0	0	0	0	0	0	0	0	4
Soybean	0	1	0	0	0	0	1	0	3
Sugar beet	4	10	10	10	9	0	5	4	10
Velvetleaf	10	10	10	8	1	0	0	0	10
Wheat	0	0	2	0	0	0	0	0	0
Wild buckwheat	0	6	6	8	7	3	0	0	10
Wild oat	0	1	0	0	3	0	0	1	0

Table B

Rate 200 g/ha	COMPOUND 1	2	11	15	16	17	18	19	20	21	31	32	33	34	35	36	37	47	53	58	61	62	63	65
POSTEMERGENCE																								
Barley	2	5	3	4	4	4	1	0	4	3	3	3	4	5	4	3	5	4	3	3	3	1	1	3
Barnyardgrass	7	6	9	4	2	6	3	4	9	10	1	10	5	10	5	7	10	4	10	9	9	2	1	8
Bedstraw	6	9	8	7	5	7	6	3	9	9	10	10	9	10	10	10	10	3	9	10	-	10	-	9
Blackgrass	3	3	2	3	5	5	1	0	5	6	3	3	4	6	5	4	7	3	3	2	2	4	1	3
Chickweed	7	8	8	2	3	7	0	0	9	10	9	10	10	10	10	10	10	5	10	10	4	3	2	5
Cocklebur	9	10	10	10	7	9	7	6	10	10	10	10	10	10	10	10	10	10	10	10	10	10	5	10
Corn	3	3	9	3	3	7	2	2	3	9	2	7	3	8	3	3	6	3	4	2	6	6	1	5
Cotton	10	10	10	9	10	10	3	8	10	10	10	10	10	10	10	10	10	10	10	10	10	9	7	10
Crabgrass	2	6	7	3	6	4	3	5	3	7	4	4	3	8	3	3	2	2	1	2	4	2	1	2
Downy brome	2	3	2	3	4	4	0	0	4	4	3	2	3	5	4	3	5	3	3	2	2	1	0	3
Giant foxtail	2	6	7	5	6	6	6	5	7	8	3	3	4	6	4	3	8	2	2	2	4	2	1	3
Lambsquarter	7	10	10	9	10	9	6	7	10	10	10	10	10	10	10	10	10	9	10	10	9	6	2	10
Morningglory	7	10	10	10	10	10	7	6	10	10	10	10	10	10	10	10	10	10	10	10	10	10	4	10
Nutsedge	2	2	2	5	2	6	0	0	1	3	3	2	3	4	5	5	3	-	1	1	8	2	0	2
Rape	5	10	10	3	9	9	4	3	10	10	10	10	10	10	10	10	10	10	10	10	10	10	2	10
Rice	4	6	5	4	5	5	3	4	6	6	6	3	4	9	6	4	6	2	2	3	4	3	2	4
Sorghum	3	4	4	3	3	3	4	4	5	3	3	-	-	8	7	2	2	2	2	2	3	2	1	7
Soybean	8	9	5	6	8	8	2	3	9	6	9	6	10	10	9	10	10	3	2	3	9	3	2	3
Sugar beet	9	10	10	10	9	10	4	4	10	10	10	10	10	10	10	10	10	10	10	10	10	7	3	10
Velvetleaf	10	10	10	10	10	10	6	7	10	10	10	10	10	10	10	10	10	10	10	10	10	8	4	10
Wheat	3	3	4	3	6	6	0	2	3	5	4	3	4	4	4	3	5	3	2	2	4	2	2	3
Wild buckwheat	9	10	10	9	10	10	2	3	10	10	10	10	10	10	10	10	10	10	10	10	10	1	1	10
Wild oat	1	2	3	2	3	3	0	0	4	3	3	3	3	4	3	4	7	2	3	3	1	2	1	5

Table B

Rate 200 g/ha	COMPOUND 1	2	11	15	16	17	18	19	20	21	31	32	33	34	35	36	37	47	53	58	61	62	63	65
PREEMERGENCE																								
Barley	0	0	0	0	0	0	0	0	5	4	0	0	0	3	3	0	0	0	0	0	0	0	0	1
Barnyardgrass	0	4	3	3	3	4	0	0	6	7	2	3	10	10	6	5	10	0	0	0	8	0	0	1
Bedstraw	2	9	0	0	0	3	0	0	10	10	10	10	10	10	10	10	10	7	10	10	10	2	-	-
Blackgrass	0	1	0	0	0	0	2	0	4	3	1	5	2	9	4	1	6	0	1	0	2	0	0	0
Chickweed	0	2	2	0	0	5	0	0	9	9	10	10	10	10	10	10	10	9	9	10	10	9	0	-
Cocklebur	0	3	0	0	0	0	0	0	10	10	9	10	8	10	10	10	10	1	10	10	10	0	10	10
Corn	0	0	2	0	2	0	0	0	0	2	1	0	3	4	3	2	1	0	0	0	0	0	0	0
Cotton	5	4	0	0	10	5	0	-	10	10	10	10	7	10	10	10	10	0	10	0	10	0	0	8
Crabgrass	0	6	0	2	8	3	0	0	9	5	9	2	10	10	8	2	6	2	0	0	0	0	0	0
Downy brome	0	1	0	0	0	0	2	3	3	3	3	3	2	8	5	3	5	0	0	0	0	0	0	2
Giant foxtail	1	3	0	0	2	2	0	0	9	2	4	0	8	10	6	3	7	0	0	0	0	0	0	0
Lambsquarter	10	10	10	9	10	10	10	7	10	10	10	10	10	10	10	10	10	10	10	10	10	10	-	-
Morningglory	-	4	3	0	0	0	0	0	10	10	10	10	10	10	10	10	10	10	10	10	10	0	0	10
Nutsedge	-	8	5	0	0	0	0	0	1	0	0	0	3	4	4	10	0	-	0	0	10	0	6	1
Rape	8	0	6	0	0	6	4	5	9	10	8	10	7	9	9	10	10	9	10	10	10	6	1	-
Rice	0	3	3	0	4	3	0	0	3	1	4	1	4	9	5	2	4	0	0	0	0	0	0	0
Sorghum	0	0	0	0	0	0	0	0	2	0	0	0	3	8	2	0	1	0	0	0	0	0	0	0
Soybean	0	3	0	0	6	2	0	0	3	3	10	0	9	9	10	10	10	0	0	0	0	0	0	0
Sugar beet	9	9	10	3	0	9	6	5	10	10	10	10	10	10	10	10	10	10	10	10	10	7	2	-
Velvetleaf	10	7	10	6	0	10	0	0	10	10	10	10	10	10	10	10	10	9	10	10	10	7	9	10
Wheat	0	0	0	0	0	0	0	0	3	3	0	0	3	5	6	2	3	0	2	0	0	0	0	0
Wild buckwheat	2	0	0	0	0	7	0	0	10	5	9	10	8	10	10	10	10	0	10	10	10	3	-	-
Wild oat	0	2	0	0	0	0	2	0	4	3	4	0	5	8	7	6	8	0	3	0	0	0	0	1

Table B						COMPOUND										
Rate 100 g/ha	6	7	8	9	10	38	39	40	41	42	43	44	66	67	70	72
POSTEMERGENCE																
Barley	0	3	3	3	3	0	3	3	3	3	4	3	2	0	3	3
Barnyardgrass	1	4	7	2	2	0	10	10	10	10	10	10	2	1	10	5
Bedstraw	-	-	9	10	10	2	10	10	10	10	10	9	-	-	-	9
Blackgrass	3	3	3	2	3	1	3	3	3	3	3	5	2	1	4	2
Chickweed	5	10	-	9	9	-	10	10	10	10	10	10	2	1	10	4
Cocklebur	5	10	9	10	8	0	10	10	10	10	10	10	2	2	10	7
Corn	1	1	1	2	1	0	5	7	6	4	7	8	1	1	7	3
Cotton	10	10	10	10	10	4	10	10	10	10	10	10	9	-	10	10
Crabgrass	2	2	1	2	2	1	2	4	3	2	4	4	1	1	2	7
Downy brome	2	3	2	2	2	0	3	3	3	3	4	6	2	1	3	2
Giant foxtail	2	2	2	2	2	1	3	4	3	3	3	4	2	2	5	3
Lambsquarter	5	9	9	9	9	1	10	10	10	10	10	10	3	2	10	9
Morningglory	5	2	10	10	10	2	10	10	10	10	10	10	1	2	10	8
Nutsedge	0	1	1	2	2	0	2	2	2	2	2	3	0	0	2	1
Rape	2	10	10	9	10	0	10	10	10	10	10	10	5	3	10	6
Rice	1	4	4	2	3	0	2	2	3	3	3	5	3	1	8	4
Sorghum	1	2	2	1	1	0	2	5	3	4	6	2	2	1	6	4
Soybean	2	3	3	4	4	0	2	5	4	4	6	8	2	3	7	5
Sugar beet	6	10	10	9	9	0	10	10	10	10	10	10	6	1	10	7
Velvetleaf	7	10	10	10	10	1	10	10	10	10	10	10	6	2	10	8
Wheat	0	3	3	3	2	0	4	5	3	5	4	4	4	3	6	3
Wild buckwheat	4	9	7	6	10	2	10	10	10	10	10	10	1	2	10	9
Wild oat	2	2	2	3	2	1	3	3	3	3	3	3	2	1	2	2

Table B COMPOUND

Rate 100 g/ha	6	7	8	9	10	38	39	40	41	42	43	44	66	67	70	72
PREEMERGENCE																
Barley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barnyardgrass	0	0	0	1	0	0	4	8	5	6	8	8	0	0	9	0
Bedstraw	2	2	0	4	9	0	10	10	10	10	10	10	-	-	10	-
Blackgrass	0	0	0	0	1	0	0	2	1	0	1	0	0	0	1	0
Chickweed	1	-	8	8	9	0	10	10	10	10	10	10	0	0	10	0
Cocklebur	0	2	-	2	0	0	10	10	10	10	10	10	0	0	10	0
Corn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cotton	0	0	0	0	0	0	10	10	10	10	10	10	0	0	10	0
Crabgrass	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	2
Downy brome	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Giant foxtail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lambsquarter	1	8	7	9	8	0	9	10	10	10	10	10	0	0	10	6
Morningglory	0	4	0	1	0	0	10	10	10	10	10	10	3	-	10	6
Nutsedge	0	0	-	0	0	0	0	0	0	0	0	0	0	0	1	3
Rape	0	10	4	7	0	0	10	10	10	10	10	10	0	0	10	0
Rice	0	0	0	0	0	0	0	4	0	0	0	0	0	0	5	0
Sorghum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Soybean	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Sugar beet	0	8	4	9	7	0	10	10	10	10	10	10	0	0	10	0
Velvetleaf	0	10	8	7	0	0	10	10	10	10	10	10	0	0	10	0
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wild buckwheat	0	0	0	6	3	0	9	10	10	6	8	9	0	0	8	0
Wild oat	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0

Table B

Rate 50 g/ha	COMPOUND 2	4	5	11	12	13	14	15	16	17	18	19	20	21	23	24	26	27	28	29	30	31	32	33	34	35	36	37	45
POSTEMERGENCE																													
Barley	4	2	2	2	2	3	2	2	3	3	0	0	4	2	3	3	2	2	0	1	3	3	3	4	5	4	3	4	2
Barnyardgrass	4	4	7	8	6	2	9	2	2	4	2	2	6	10	6	4	5	5	2	2	9	1	6	3	4	4	2	10	10
Bedstraw	10	6	6	7	9	9	5	7	3	7	4	2	9	9	9	9	9	8	4	3	9	9	9	9	10	10	9	10	10
Blackgrass	3	2	1	2	2	4	2	2	3	3	0	0	4	3	4	1	2	2	1	1	3	3	2	3	4	3	3	3	1
Chickweed	7	3	3	3	3	4	3	1	2	7	0	0	10	10	10	9	7	6	1	1	7	7	10	8	10	9	10	10	10
Cocklebur	9	9	8	10	7	5	6	6	4	7	1	3	10	10	10	10	8	8	4	3	10	9	10	10	10	8	10	10	10
Corn	3	2	3	4	4	1	4	2	2	2	2	4	1	5	7	1	7	2	1	1	1	1	2	1	4	2	1	6	2
Cotton	10	10	10	10	10	10	6	10	10	10	2	0	10	10	10	10	10	10	9	9	10	10	10	10	10	9	10	10	10
Crabgrass	4	2	2	4	2	3	3	2	4	5	2	4	2	7	1	1	2	1	1	1	2	3	2	3	4	4	3	2	1
Downy brome	2	2	2	1	2	4	2	2	3	2	0	0	3	3	5	1	2	3	1	1	2	2	2	3	4	2	3	4	1
Giant foxtail	4	3	3	3	1	3	2	3	4	4	3	3	3	7	3	2	2	2	1	1	2	2	2	3	4	3	2	3	2
Lambsquarter	9	9	7	10	9	10	9	9	9	8	3	4	10	10	10	10	9	9	7	7	10	9	10	9	9	10	10	10	10
Morningglory	10	10	10	7	9	6	7	5	9	9	2	4	10	10	10	10	10	10	7	10	10	10	10	10	10	9	10	10	10
Nutsedge	1	1	2	1	1	0	0	0	4	1	0	0	-	1	1	1	1	1	1	1	1	3	1	2	2	3	2	2	1
Rape	10	10	6	9	9	8	9	6	7	6	3	2	10	10	10	10	3	2	2	1	9	9	10	10	10	8	10	10	10
Rice	4	3	4	3	3	4	3	3	4	5	3	3	3	4	3	2	4	1	1	1	2	3	3	3	6	5	2	3	2
Sorghum	4	4	4	3	4	3	4	2	4	2	2	3	2	2	2	3	2	2	1	1	1	2	3	4	3	3	2	2	2
Soybean	7	8	7	1	2	7	4	2	8	6	1	2	8	5	2	5	2	2	1	1	5	8	2	9	9	8	8	8	2
Sugar beet	10	10	10	10	10	10	9	3	10	10	3	2	10	10	10	10	9	10	2	2	10	10	10	10	10	10	10	10	10
Velvetleaf	9	10	10	10	10	10	10	10	9	10	1	1	10	10	10	10	10	10	5	3	10	8	10	10	10	8	10	10	10
Wheat	2	2	2	2	1	3	2	2	3	3	0	0	4	3	3	2	2	2	0	1	3	4	3	4	4	3	2	4	2
Wild buckwheat	10	10	10	10	7	9	9	9	8	10	2	1	10	10	10	10	8	7	3	2	10	10	10	10	10	10	10	10	8
Wild oat	2	2	1	1	2	3	1	2	3	3	0	0	2	2	3	2	2	3	1	0	3	2	3	2	3	2	3	4	1

Table B						COMPOUND						
Rate 50 g/ha	47	48	50	51	53	58	59	61	62	63	65	68
POSTEMERGENCE												
Barley	1	1	1	0	3	3	1	1	0	0	2	2
Barnyardgrass	2	3	5	2	4	3	2	5	1	0	3	1
Bedstraw	2	8	4	4	8	10	6	-	-	1	6	6
Blackgrass	2	1	1	1	2	2	1	2	1	1	2	2
Chickweed	3	3	6	2	9	10	8	3	2	1	4	2
Cocklebur	8	5	9	1	10	10	8	10	8	3	9	2
Corn	2	1	6	1	1	2	1	3	0	0	1	1
Cotton	10	10	10	9	10	10	10	10	9	6	10	10
Crabgrass	1	1	3	1	1	2	4	3	1	0	2	1
Downy brome	2	0	1	0	3	2	3	1	0	0	2	2
Giant foxtail	1	2	2	1	1	2	3	3	1	0	2	1
Lambsquarter	7	4	9	4	8	9	8	8	4	2	10	7
Morningglory	10	10	7	2	10	10	10	10	7	4	10	2
Nutsedge	0	1	1	1	1	0	2	3	1	0	1	0
Rape	9	9	10	2	10	10	10	10	7	1	10	3
Rice	1	2	3	2	2	2	4	3	0	0	2	1
Sorghum	1	2	2	1	1	2	3	3	0	0	2	1
Soybean	2	2	3	2	2	3	6	4	2	0	3	2
Sugar beet	10	3	8	2	10	9	10	10	6	2	10	8
Velvetleaf	10	7	10	5	10	10	8	10	1	0	10	10
Wheat	3	2	1	0	2	2	1	2	1	0	3	1
Wild buckwheat	8	6	10	6	10	10	10	3	1	0	10	3
Wild oat	2	1	1	1	3	2	2	1	1	0	2	2

Table B	COMPOUND																												
Rate 50 g/ha	2	4	5	11	12	13	14	15	16	17	18	19	20	21	23	24	26	27	28	29	30	31	32	33	34	35	36	37	45
PREEMERGENCE																													
Barley	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Barnyardgrass	3	0	0	2	0	0	3	0	0	0	0	0	3	3	3	1	0	0	0	0	0	1	0	3	8	0	2	6	0
Bedstraw	4	9	9	9	3	3	0	0	0	0	0	-	8	10	10	10	0	0	0	6	9	6	9	10	10	10	10	10	10
Blackgrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	6	1	1	2	2
Chickweed	0	0	0	0	0	0	3	0	0	3	0	0	9	8	9	10	9	1	3	0	7	9	9	9	10	9	10	10	10
Cocklebur	1	0	0	0	0	0	4	0	0	0	0	0	7	10	10	10	2	3	0	0	10	9	10	6	8	8	10	10	10
Corn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0
Cotton	3	0	7	0	0	0	0	0	0	5	0	0	0	10	10	10	3	0	0	0	10	7	10	7	1	10	10	10	2
Crabgrass	0	0	0	0	0	2	0	0	3	3	0	0	8	2	2	0	0	0	0	0	0	3	0	5	7	3	0	0	0
Downy brome	0	0	0	0	0	0	0	0	0	0	2	0	2	2	3	0	0	0	0	0	0	0	0	1	5	3	0	5	0
Giant foxtail	3	0	0	0	0	0	0	0	0	0	0	0	7	2	0	0	0	0	0	0	0	2	0	1	6	2	0	0	0
Lambsquarter	10	10	9	10	9	10	8	7	10	10	6	0	10	10	10	10	10	9	7	8	10	10	10	10	10	10	10	10	10
Morningglory	3	0	0	0	1	0	5	-	0	0	0	0	10	10	10	10	10	10	0	0	10	7	10	10	10	8	10	10	10
Nutsedge	0	0	0	3	0	0	5	0	0	-	0	0	0	0	8	0	0	0	0	0	0	0	0	0	1	0	10	0	0
Rape	0	0	0	1	0	0	0	0	0	2	2	0	9	10	10	9	0	0	0	0	8	6	10	3	5	7	10	10	10
Rice	2	0	0	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	4	2	3	0
Sorghum	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0
Soybean	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	7	0	6	9	7	4	3	0
Sugar beet	4	9	8	10	10	10	10	0	0	7	3	0	10	10	10	10	9	9	0	0	10	10	10	10	10	10	10	10	9
Velvetleaf	4	7	10	9	5	10	10	0	0	7	0	0	10	10	10	10	7	2	0	0	10	10	10	10	10	10	10	10	10
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	2	0	2	3	0
Wild buckwheat	0	0	1	0	3	5	3	0	0	0	0	0	7	5	10	7	0	0	0	0	9	8	7	4	10	10	9	10	8
Wild oat	0	0	0	0	0	0	0	0	0	0	0	0	4	2	3	0	0	0	0	0	0	2	0	0	5	2	5	5	1

Table B						COMPOUND						
Rate 50 g/ha	47	48	50	51	53	58	59	61	62	63	65	68
PREEMERGENCE												
Barley	0	0	1	0	0	0	0	0	0	0	0	0
Barnyardgrass	0	0	0	0	0	0	0	2	0	0	0	0
Bedstraw	0	5	10	-	9	10	3	10	0	0	-	1
Blackgrass	0	0	2	0	0	0	2	0	0	0	0	2
Chickweed	3	0	9	0	9	10	9	10	0	0	-	6
Cocklebur	0	0	3	0	10	10	2	10	0	6	0	0
Corn	0	0	0	0	0	0	0	0	0	0	0	0
Cotton	0	0	0	0	3	0	0	9	0	0	4	0
Crabgrass	0	0	0	0	0	0	2	0	0	0	0	0
Downy brome	0	0	2	0	0	0	1	0	0	0	0	0
Giant foxtail	0	0	0	0	0	0	1	0	0	0	0	0
Lambsquarter	7	0	10	0	10	10	10	10	0	0	-	7
Morningglory	0	0	0	0	10	10	3	5	0	0	10	0
Nutsedge	0	0	0	0	0	0	0	0	0	2	0	0
Rape	3	0	3	0	8	10	0	10	0	0	-	3
Rice	0	0	0	0	0	0	0	0	0	0	0	0
Sorghum	0	0	0	0	0	0	0	0	0	0	0	0
Soybean	0	0	0	0	0	0	0	0	0	0	0	0
Sugar beet	4	0	10	0	7	9	10	10	5	0	-	8
Velvetleaf	3	0	0	0	10	10	10	10	3	2	10	0
Wheat	0	0	1	0	0	0	1	0	0	0	0	0
Wild buckwheat	0	1	0	0	4	5	9	4	0	0	-	3
Wild oat	0	0	3	0	2	0	2	0	0	0	0	3

Table B	COMPOUND						
Rate 20 g/ha	39	40	41	42	43	44	72
POSTEMERGENCE							
Barley	3	3	2	2	3	3	2
Barnyardgrass	10	10	10	10	8	10	1
Bedstraw	9	10	9	10	9	9	8
Blackgrass	2	1	2	1	2	2	1
Chickweed	10	10	10	10	9	10	2
Cocklebur	10	10	10	10	10	10	7
Corn	1	3	2	2	2	2	1
Cotton	10	10	10	10	10	10	10
Crabgrass	2	2	2	2	2	2	4
Downy brome	2	2	2	2	2	3	1
Giant foxtail	2	2	3	2	3	4	1
Lambsquarter	9	10	10	10	10	10	8
Morningglory	10	10	10	10	10	10	6
Nutsedge	1	-	1	1	1	2	1
Rape	10	10	10	10	10	10	2
Rice	2	2	2	2	2	3	3
Sorghum	2	2	3	2	2	2	-
Soybean	2	3	2	3	3	3	3
Sugar beet	10	10	10	10	10	10	3
Velvetleaf	10	10	10	10	10	10	3
Wheat	2	3	3	3	4	3	1
Wild buckwheat	10	10	10	10	10	10	7
Wild oat	2	2	2	2	3	2	1

Table B	COMPOUND						
Rate 20 g/ha	39	40	41	42	43	44	72
PREEMERGENCE							
Barley	0	0	0	0	0	0	0
Barnyardgrass	1	2	3	3	1	4	0
Bedstraw	10	9	8	10	9	10	0
Blackgrass	0	0	0	0	0	0	0
Chickweed	10	10	10	10	10	10	0
Cocklebur	10	10	10	10	10	10	0
Corn	0	0	0	0	0	0	0
Cotton	9	10	10	10	10	10	0
Crabgrass	0	0	0	0	0	0	0
Downy brome	0	0	0	0	0	0	0
Giant foxtail	0	0	0	0	0	0	0
Lambsquarter	9	10	9	10	10	10	0
Morningglory	10	10	10	10	10	10	3
Nutsedge	0	0	0	0	0	0	0
Rape	9	10	10	10	10	9	0
Rice	0	0	0	0	0	0	0
Sorghum	0	0	0	0	0	0	0
Soybean	0	0	0	0	0	0	0
Sugar beet	10	10	10	10	10	10	0
Velvetleaf	10	10	10	10	10	10	0
Wheat	0	0	0	0	0	0	0
Wild buckwheat	6	9	2	4	6	9	0
Wild oat	0	0	0	0	0	0	0

Table B

Rate 10 g/ha	COMPOUND																	
POSTEMERGENCE	4	5	12	13	14	23	24	26	27	28	29	30	45	48	50	51	59	68
Barley	1	1	1	2	1	3	1	1	1	0	0	1	0	0	0	0	0	0
Barnyardgrass	1	3	2	1	3	3	3	4	2	1	1	3	4	1	1	1	2	1
Bedstraw	4	6	4	5	5	9	9	7	7	3	0	9	-	3	3	1	3	6
Blackgrass	1	1	0	2	1	2	1	1	1	0	0	1	1	0	1	0	1	2
Chickweed	2	3	2	1	0	9	9	3	2	0	0	3	10	0	1	1	8	1
Cocklebur	7	7	3	3	6	10	10	4	3	1	1	9	10	1	5	1	7	0
Corn	2	3	1	1	0	1	1	1	1	1	1	1	1	0	2	1	2	0
Cotton	10	10	10	10	-	10	10	10	9	8	9	10	10	9	3	9	9	8
Crabgrass	2	2	1	3	1	1	1	1	1	1	1	1	1	0	2	1	2	0
Downy brome	2	1	1	3	1	2	0	0	1	0	0	1	1	0	1	0	1	1
Giant foxtail	2	3	1	2	1	2	1	1	1	1	1	1	2	1	0	1	2	1
Lambsquarter	3	2	8	9	9	9	9	9	8	3	3	9	8	3	7	0	7	5
Morningglory	8	10	2	1	5	10	10	8	10	1	1	10	7	1	6	1	10	1
Nutsedge	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0
Rape	9	2	3	6	5	9	10	1	0	0	0	8	9	2	10	0	3	2
Rice	3	3	2	3	1	2	2	1	1	0	0	2	2	0	1	0	2	0
Sorghum	3	3	2	3	2	1	2	1	2	0	0	1	2	0	1	0	2	0
Soybean	6	3	2	4	0	2	3	0	1	0	0	2	2	1	1	0	5	1
Sugar beet	7	8	10	9	9	10	10	9	6	1	1	10	10	1	5	0	8	6
Velvetleaf	8	10	10	4	10	10	10	8	8	1	1	10	10	3	5	2	4	6
Wheat	2	1	0	2	1	2	1	0	0	0	0	2	1	0	0	0	1	0
Wild buckwheat	6	10	6	7	8	10	10	4	5	1	0	9	6	2	6	1	3	2
Wild oat	1	1	0	1	1	2	1	0	1	0	0	1	1	0	0	0	1	1

Table B

Rate 10 g/ha	COMPOUND																	
	4	5	12	13	14	23	24	26	27	28	29	30	45	48	50	51	59	68
PREEMERGENCE																		
Barley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barnyardgrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bedstraw	0	0	2	0	0	10	0	0	-	-	2	3	10	0	0	0	0	1
Blackgrass	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Chickweed	0	0	0	0	0	9	7	3	0	0	0	2	10	0	0	0	0	0
Cocklebur	0	0	0	0	0	10	4	0	0	0	0	3	5	0	0	0	0	0
Corn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cotton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crabgrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Downy brome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Giant foxtail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lambsquarter	0	0	7	8	8	9	8	9	6	0	4	9	9	0	8	0	10	0
Morningglory	0	0	1	0	0	10	2	0	10	0	0	3	5	0	-	0	0	0
Nutsedge	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Rape	0	0	0	0	0	10	0	0	0	0	0	8	10	0	0	0	0	0
Rice	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sorghum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Soybean	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sugar beet	0	0	6	3	7	10	5	3	3	0	0	9	7	0	7	0	3	6
Velvetleaf	0	0	0	0	0	10	8	0	0	0	0	10	5	0	0	0	1	0
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wild buckwheat	0	0	0	0	0	9	1	0	0	0	0	3	3	0	0	0	0	3
Wild oat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3

TEST C

The compounds evaluated in this test were formulated in a non-phytoxic solvent mixture which included a surfactant and applied to the soil surface before plant seedlings emerged (preemergence application), to water that covered the soil surface (flood application), and to plants that were in the one-to-four leaf stage (postemergence application). A sandy loam soil was used for the preemergence and postemergence tests, while a silt loam soil was used in the flood test. Water depth was approximately 2.5 cm for the flood test and was maintained at this level for the duration of the test.

Plant species in the preemergence and postemergence tests consisted of barnyardgrass (*Echinochloa crus-galli*), barley (*Hordeum vulgare*), bedstraw (*Galium aparine*), blackgrass (*Alopecurus myosuroides*), chickweed (*Stellaria media*), cocklebur (*Xanthium strumarium*), corn (*Zea mays*), cotton (*Gossypium hirsutum*), crabgrass (*Digitaria sanguinalis*), downy brome (*Bromus tectorum*), of barnyardgrass (*Echinochloa crus-galli*), barley (*Hordeum vulgare*), bedstraw (*Galium aparine*), blackgrass (*Alopecurus myosuroides*), chickweed (*Stellaria (Galium aparine)*, blackgrass (*Alopecurus myosuroides*), chickweed (*Stellaria media*), cocklebur (*Xanthium strumarium*), corn (*Zea mays*), cotton (*Gossypium hirsutum*), crabgrass (*Digitaria sanguinalis*), downy brome (*Bromus tectorum*), giant foxtail (*Setaria faberii*), johnsongrass (*Sorghum halpense*), lambsquarters (*Chenopodium album*), morningglory (*Ipomoea hederacea*), pigweed (*Amaranthus retroflexus*), rape (*Brassica napus*), ryegrass (*Lolium multiflorum*), soybean (*Glycine max*), speedwell (*Veronica persica*), sugar beet (*Beta vulgaris*), velvetleaf (*Abutilon theophrasti*), wheat (*Triticum aestivum*), wild buckwheat (*Polygonum convolvulus*), and wild oat (*Avena fatua*). All plant species were planted one day before application of the compound for the preemergence portion of this test. Plantings of these species were adjusted to produce plants of appropriate size for the postemergence portion of the test. Plant species in the flood test consisted of rice (*Oryza sativa*), umbrella sedge (*Cyperus difformis*), duck salad (*Heteranthera limosa*), barnyardgrass (*Echinochloa crus-galli*) and Late watergrass (*Echinocloa oryzicola*) grown to the 2 leaf stage for testing.

All plant species were grown using normal greenhouse practices. Visual evaluations of injury expressed on treated plants, when compared to untreated controls, were recorded approximately fourteen to twenty one days after application of the test compound. Plant response this ratings, summarized in Table C, were recorded on a 0 to 100 scale where 0 is no effect and 100 is complete control. A dash (-) response means no test result.

Table C	COMPOUND
Rate 125 g/ha	2
POSTEMERGENCE	
Barley Igri	35
Barnyard 2	35
Barnyardgrass	45
Bedstraw	-
Blackgrass	35
Chickweed	95
Cocklebur	100
Corn	20
Cotton	100
Crabgrass	65
Downy Brome	30
Duck salad	0
Giant foxtail	70
Italn. Rygrass	10
Johnsongrass	30
Lambsquarter	100
Morningglory	100
Rape	100
Redroot Pigweed	100
Rice Japonica	40
Soybean	70
Speedwell	95
Sugar beet	100
Umbrella sedge	0
Velvetleaf	100
Watergrass 2	30
Wheat	25
Wild buckwheat	100
Wild oat	35

Table C	COMPOUND
Rate 125 g/ha	2
PREEMERGENCE	
Barley Igri	0
Barnyardgrass	50
Bedstraw	35
Blackgrass	40
Chickweed	40
Cocklebur	10
Corn	0
Cotton	-
Crabgrass	60
Downy Brome	0
Giant foxtail	25
Italn. Rygrass	0
Johnsongrass	75
Lambsquarter	100
Morningglory	65
Rape	0
Redroot Pigweed	75
Soybean	20
Speedwell	70
Sugar beet	100
Velvetleaf	100
Wheat	0
Wild buckwheat	30
Wild oat	0

Table C COMPOUND

Rate 62 g/ha	1	2	3	4	5	7	8	9	10	11	12	13	14	20	21	45	65	70
POSTEMERGENCE																		
Barley Igri	35	35	35	25	30	0	20	20	30	30	40	45	45	40	35	0	30	10
Barnyard 2	20	30	25	20	15	0	0	20	40	30	10	65	0	20	35	-	0	-
Barnyardgrass	60	30	35	40	50	15	10	10	0	85	60	35	50	75	100	70	50	60
Bedstraw	100	100	-	100	100	50	70	100	70	50	45	40	55	100	100	100	80	100
Blackgrass	10	35	15	25	20	10	40	20	10	15	20	30	25	10	10	70	20	70
Chickweed	100	80	10	35	90	-	-	100	100	80	30	85	55	100	100	100	40	100
Cocklebur	100	90	90	100	100	100	90	100	100	100	50	60	70	100	100	100	100	100
Corn	30	15	25	35	35	15	20	20	15	50	80	35	50	35	55	10	10	40
Cotton	100	100	100	100	100	100	100	100	100	100	100	90	-	100	100	100	100	100
Crabgrass	35	50	40	30	50	30	20	15	20	30	35	35	50	35	50	30	20	50
Downy Brome	30	30	20	30	10	0	30	0	0	0	20	30	25	20	0	20	0	35
Duck salad	0	0	0	0	0	0	0	40	10	0	0	0	0	0	0	-	0	-
Giant foxtail	40	60	35	60	50	20	15	25	20	35	55	45	35	55	75	40	20	60
Italn. Rygrass	35	10	20	25	20	0	0	30	10	0	0	10	20	30	0	20	30	10
Johnsongrass	-	30	60	60	50	20	0	25	20	60	50	50	60	40	55	35	50	65
Lambsquarter	100	100	-	100	90	70	100	80	60	100	100	100	100	100	100	100	80	100
Morningglory	90	100	90	85	90	100	100	100	100	100	70	85	50	100	100	100	100	100
Rape	90	100	65	50	80	80	30	70	60	100	90	100	100	100	100	100	100	100
Redroot Pigweed	100	100	90	100	95	70	50	30	50	100	100	100	100	100	100	100	100	100
Rice Japonica	-	35	35	25	25	0	0	20	0	30	0	45	15	35	20	-	0	-
Soybean	50	70	40	70	60	40	30	35	35	30	35	70	40	80	40	20	50	50
Speedwell	100	90	100	-	-	90	-	100	60	70	85	-	100	100	100	100	100	100

Sugar beet	100	100	-	100	100	-	-	80	70	100	100	100	100	100	100	-	-	-
Umbrella sedge	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	-	0	-
Velvetleaf	100	100	100	100	100	100	90	100	90	100	100	100	100	100	100	100	100	100
Watergrass 2	15	30	15	15	15	-	-	-	-	20	10	65	0	25	20	-	-	-
Wheat	35	25	30	25	30	0	10	20	20	20	35	40	40	30	25	0	0	10
Wild buckwheat	100	95	100	100	100	70	85	90	70	85	100	95	100	100	100	100	100	100
Wild oat	30	35	35	25	25	10	40	20	40	10	35	45	40	35	30	0	30	20

Table C

Rate 62 g/ha PREEMERGENCE	COMPOUND 1	2	3	4	5	7	8	9	10	11	12	13	14	20	21	45	65	70
Barley Igri	0	0	0	0	0	0	0	0	0	0	0	15	0	20	0	0	10	0
Barnyardgrass	0	20	0	20	0	0	0	10	0	20	0	50	0	80	35	30	0	20
Bedstraw	10	35	0	0	85	0	0	90	40	20	0	0	0	100	100	60	100	50
Blackgrass	0	40	0	0	10	0	0	0	0	20	0	0	0	0	20	0	20	20
Chickweed	10	40	0	0	0	60	30	70	100	0	0	10	0	100	100	100	-	100
Cocklebur	0	10	20	10	20	60	10	30	0	20	0	0	0	100	100	100	60	100
Corn	0	0	0	0	0	0	0	0	0	0	0	0	30	10	0	0	0	0
Cotton	0	0	50	0	40	0	0	0	0	50	0	0	0	100	100	60	70	60
Crabgrass	0	20	0	90	0	0	0	0	0	0	0	20	0	100	0	0	30	0
Downy Brome	0	0	10	0	0	0	0	0	0	0	0	0	0	0	20	0	0	10
Giant foxtail	20	25	0	0	0	0	0	0	0	20	0	10	0	90	20	0	10	40
Italn. Rygrass	0	0	0	0	10	0	0	0	0	0	20	20	0	10	30	0	0	0
Johnsongrass	-	60	0	20	0	0	10	0	0	0	0	30	0	40	0	0	0	0
Lambsquarter	100	100	90	100	100	100	40	70	60	35	100	100	100	100	100	100	100	100
Morningglory	50	65	30	10	0	30	0	30	0	60	0	10	0	100	100	100	100	100
Rape	70	0	0	10	100	0	0	30	0	10	15	0	30	100	100	100	30	100
Redroot Pigweed	100	-	80	75	0	0	20	35	0	100	50	30	60	100	100	100	100	100
Soybean	20	0	0	0	0	10	0	0	0	10	0	0	0	60	45	0	10	0
Speedwell	100	70	100	100	100	60	0	80	90	0	0	0	25	100	100	95	30	100
Sugar beet	100	90	100	100	100	60	0	60	0	100	100	100	100	100	100	100	-	100
Velvetleaf	100	80	100	100	100	100	100	0	10	100	100	30	100	100	100	100	100	100
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0
Wild buckwheat	10	30	10	0	0	10	0	0	0	25	0	0	25	90	95	100	30	90
Wild oat	0	0	10	0	10	0	0	0	0	0	0	0	0	0	0	0	10	0

Table C COMPOUND

Rate 31 g/ha	1	2	3	4	5	7	8	9	10	11	12	13	14	20	21	23	25	26	27	28	29	30
POSTEMERGENCE																						
Barley Igri	30	35	35	25	30	0	10	10	20	30	25	40	35	40	35	30	40	20	20	10	0	25
Barnyard 2	20	30	20	20	15	0	0	0	10	25	0	50	0	15	25	20	0	20	15	10	10	10
Barnyardgrass	50	30	30	35	40	10	10	0	0	75	50	30	40	50	90	100	100	85	70	60	60	100
Bedstraw	80	100	100	50	100	40	70	50	35	-	45	40	45	100	100	100	100	90	90	45	45	70
Blackgrass	0	30	10	20	20	10	30	0	10	15	10	30	25	10	10	25	50	20	15	15	15	15
Chickweed	80	80	10	35	65	-	-	90	75	70	30	30	55	100	100	100	100	70	50	40	0	90
Cocklebur	90	90	90	90	95	100	80	70	80	90	35	50	40	100	100	100	100	80	80	70	60	100
Corn	20	15	20	30	30	10	15	15	10	35	30	35	40	25	40	20	30	35	25	20	10	30
Cotton	100	100	100	100	100	100	100	100	90	100	95	90	90	100	100	100	100	100	100	90	90	100
Crabgrass	30	40	40	20	40	20	10	10	20	30	30	25	50	35	40	60	50	35	35	20	20	30
Downy Brome	20	30	20	30	10	0	0	0	0	0	15	20	25	20	0	25	25	10	0	0	0	0
Duck salad	0	0	0	0	0	0	0	40	10	0	0	0	0	0	0	0	0	0	0	0	0	0
Giant foxtail	30	60	-	40	40	10	10	20	10	30	35	35	30	40	70	50	50	25	25	20	15	35
Italn. Rygrass	25	10	20	25	15	0	0	0	0	0	0	0	20	25	0	20	45	0	10	0	10	10
Johnsongrass	-	25	50	30	40	10	0	10	10	35	30	40	35	30	40	-	70	60	40	30	20	20
Lambsquarter	100	100	100	95	85	70	60	60	40	95	95	-	100	100	100	100	100	95	95	95	60	95
Morningglory	90	100	90	85	90	100	100	100	70	-	60	80	50	100	100	100	100	100	100	90	60	100
Rape	90	100	10	40	80	40	20	40	50	95	90	95	85	100	100	100	100	35	70	10	0	100
Redroot Pigweed	80	100	90	100	90	70	50	30	40	100	100	100	100	100	100	100	100	90	100	80	90	100
Rice Japonica	30	30	20	20	25	0	0	20	0	25	0	35	15	25	20	20	0	20	20	15	0	0
Soybean	40	55	40	60	40	30	30	30	30	25	35	60	35	80	40	35	50	35	65	40	35	40
Speedwell	95	90	100	100	100	90	50	100	0	0	80	80	-	100	100	-	100	95	90	35	0	90

Sugar beet	100	100	100	100	100	-	-	60	60	100	100	100	100	100	100	100	100	100	100	90	80	100
Umbrella sedge	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	20	0	0	0
Velvetleaf	100	100	100	100	100	90	90	30	80	100	100	100	100	100	100	100	100	100	100	85	60	100
Watergrass 2	10	30	15	15	15	-	-	-	-	10	0	50	0	20	20	35	-	25	10	10	0	10
Wheat	30	20	30	25	30	0	0	10	10	15	20	40	30	20	20	30	35	20	15	10	10	20
Wild buckwheat	85	80	100	-	100	70	40	90	60	85	95	95	95	100	100	100	100	100	95	70	65	100
Wild oat	30	35	35	25	25	0	35	0	30	10	35	45	35	35	30	25	25	15	15	10	0	25

Table C

Rate 31 g/ha	36	37	45	46	49	52	53	54	56	57	60	64	65	68	69	70	73
POSTEMERGENCE																	
Barley Igri	20	20	0	20	30	30	35	30	25	30	20	20	20	0	30	20	0
Barnyard 2	-	-	-	10	-	10	0	0	0	0	-	0	0	0	0	-	0
Barnyardgrass	20	80	60	55	95	100	100	100	55	90	55	60	40	10	80	80	0
Bedstraw	100	100	100	50	50	90	85	85	100	100	50	95	70	0	100	100	-
Blackgrass	25	30	50	0	25	25	20	25	15	25	10	10	10	0	10	40	0
Chickweed	100	100	-	10	95	100	100	95	60	60	100	95	-	0	95	-	0
Cocklebur	100	100	100	70	100	100	100	100	80	100	100	100	100	40	100	100	20
Corn	10	10	10	20	35	30	30	20	20	75	10	15	10	10	20	60	5
Cotton	100	100	100	100	100	100	100	100	80	100	100	100	100	80	100	100	10
Crabgrass	10	20	20	30	30	30	50	50	60	60	20	30	15	10	30	50	0
Downy Brome	10	20	10	0	10	25	10	0	20	70	10	25	0	0	25	20	0
Duck salad	-	-	-	0	-	0	0	0	0	0	-	0	0	0	0	-	0
Giant foxtail	15	25	30	20	25	35	40	50	60	70	20	20	15	0	30	75	0
Italn. Rygrass	20	20	15	0	10	20	0	0	20	40	10	20	10	0	25	30	0
Johnsongrass	10	20	25	30	50	25	50	40	50	90	10	20	40	10	50	50	10
Lambsquarter	95	100	100	70	85	100	100	100	70	100	90	95	70	85	65	80	10
Morningglory	100	100	100	100	85	100	100	100	80	100	100	100	100	35	100	100	30
Rape	100	100	100	90	95	100	100	100	95	100	100	100	100	0	100	100	0
Redroot Pigweed	100	100	100	100	90	100	90	100	90	100	100	95	80	60	90	90	15
Rice Japonica	-	-	-	20	-	0	0	0	0	0	-	0	0	10	0	-	0
Soybean	80	60	20	40	25	50	35	50	40	-	20	40	40	30	60	60	30
Speedwell	100	100	100	100	100	100	100	100	90	100	100	95	100	0	100	100	0

Sugar beet	90	100	-	100	100	100	100	100	40	25	100	100	-	65	100	-	0
Umbrella sedge	-	-	-	0	-	0	0	0	0	0	-	0	0	0	0	-	0
Velvetleaf	100	100	100	100	100	100	100	100	90	100	100	100	100	100	100	100	20
Watergrass 2	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-
Wheat	10	10	0	40	30	30	30	25	25	30	10	25	0	0	30	20	0
Wild buckwheat	100	100	90	80	100	100	100	100	100	100	100	100	100	35	95	90	0
Wild oat	10	25	0	10	20	35	0	25	30	45	10	25	10	0	25	0	0

Table C	COMPOUND																				
Rate 31 g/ha	1	2	3	4	5	7	8	9	10	11	12	13	14	20	21	23	25	26	27	28	29	30
PREEMERGENCE																						
Barley Igri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barnyardgrass	0	10	0	0	-	0	0	0	0	0	0	40	0	50	30	50	0	0	0	0	0	0
Bedstraw	0	35	0	0	0	0	0	0	40	20	0	0	0	100	100	-	100	0	0	10	0	0
Blackgrass	0	30	0	0	10	0	0	0	0	10	0	0	0	0	0	25	0	0	0	0	10	0
Chickweed	0	40	0	0	0	0	30	60	75	0	0	0	0	100	100	100	95	70	90	35	0	35
Cocklebur	0	0	0	0	-	10	0	0	0	0	0	0	0	100	100	100	100	0	20	0	0	100
Corn	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cotton	0	0	30	0	-	0	0	0	0	10	0	0	0	70	100	100	100	10	0	20	0	60
Crabgrass	0	0	0	30	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0
Downy Brome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10	0	0	0	0	0
Giant foxtail	0	0	0	0	0	0	0	0	0	0	0	0	0	90	10	0	0	10	10	60	0	10
Italn. Rygrass	0	0	0	0	10	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0
Johnsongrass	10	0	0	20	-	0	10	0	0	0	0	20	0	30	0	0	0	0	10	30	40	0
Lambsquarter	95	95	90	95	95	80	30	10	20	20	95	100	100	100	100	100	100	95	90	25	70	100
Morningglory	10	50	20	10	0	20	0	10	0	0	0	0	0	100	100	100	100	100	10	50	0	100
Rape	30	0	0	10	45	0	0	0	0	0	0	0	20	100	100	100	100	10	10	0	0	15
Redroot Pigweed	90	55	70	75	0	0	10	0	0	100	40	20	40	100	100	100	100	100	100	80	95	100
Soybean	0	0	0	-	-	0	0	0	0	0	0	0	0	30	0	0	0	0	0	0	0	-
Speedwell	100	65	100	100	100	60	0	50	80	-	0	0	0	100	100	100	100	0	35	0	100	100
Sugar beet	100	70	30	95	100	20	0	0	0	100	100	100	100	100	100	100	100	100	100	0	10	100
Velvetleaf	100	20	85	80	100	50	60	0	0	100	70	10	40	100	100	100	100	0	35	0	0	100
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wild buckwheat	0	30	0	0	0	0	0	0	0	20	0	0	0	90	90	100	100	0	0	35	20	40
Wild oat	0	0	10	0	10	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0

Table C

Rate 31 g/ha	COMPOUND 36	37	45	46	49	52	53	54	56	57	60	64	65	68	69	70	73
PREEMERGENCE																	
Barley Igri	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0
Barnyardgrass	0	50	10	0	10	30	0	0	40	100	10	0	0	0	0	0	0
Bedstraw	70	100	40	0	10	75	30	95	95	100	55	0	40	0	95	100	0
Blackgrass	0	20	0	0	0	0	25	0	60	100	10	0	10	20	0	10	10
Chickweed	-	-	100	10	95	0	90	95	95	100	95	100	-	100	95	0	0
Cocklebur	100	75	65	0	0	40	100	60	0	85	90	30	40	20	0	25	20
Corn	0	0	0	10	10	10	0	0	0	25	0	0	0	0	0	0	0
Cotton	20	80	40	20	0	100	100	90	20	100	100	30	30	10	100	100	0
Crabgrass	0	20	0	0	20	20	0	60	100	100	0	0	15	0	0	0	0
Downy Brome	0	0	0	10	0	0	10	0	0	35	0	0	0	0	0	0	0
Giant foxtail	0	60	0	0	0	10	0	0	100	100	0	0	0	0	0	0	0
Italn. Rygrass	20	0	0	10	0	0	0	0	10	85	0	0	0	0	0	0	0
Johnsongrass	0	40	0	0	0	0	0	0	40	95	0	0	0	30	0	20	0
Lambsquarter	100	100	100	90	95	100	100	100	100	100	100	100	100	95	100	100	0
Morningglory	100	100	100	0	0	100	75	100	30	85	100	100	100	0	80	100	20
Rape	95	100	100	100	90	100	100	95	10	90	100	95	10	100	100	100	0
Redroot Pigweed	100	100	100	30	20	10	95	100	100	100	100	80	80	-	100	100	0
Soybean	30	10	0	0	0	10	0	0	20	100	0	0	0	0	0	20	0
Speedwell	100	100	95	25	100	100	90	100	95	100	100	100	-	100	100	100	0
Sugar beet	-	-	100	10	100	100	100	100	90	100	100	100	-	0	100	-	65
Velvetleaf	100	100	100	0	100	100	100	100	100	100	100	100	100	0	100	100	0
Wheat	0	0	0	0	0	0	0	0	0	55	0	0	0	25	0	0	0
Wild buckwheat	60	85	30	0	10	65	90	80	95	100	45	15	0	0	0	40	0
Wild oat	0	0	0	0	0	0	10	0	0	90	0	0	0	25	0	0	0

Table C

Rate 16 g/ha	COMPOUND 1	2	3	4	5	7	8	9	10	11	12	13	14	20	21	23	24	25	26	27	28	29
POSTEMERGENCE																						
Barley Igri	30	35	35	25	30	0	0	10	20	20	10	40	25	30	30	30	0	35	15	15	10	0
Barnyard 2	15	30	10	15	15	0	0	0	0	25	0	0	0	0	10	20	0	0	10	10	10	10
Barnyardgrass	35	30	25	35	35	0	0	0	0	60	50	25	40	30	70	95	30	100	80	60	40	40
Bedstraw	65	85	95	50	95	40	50	30	20	0	40	35	40	90	90	100	95	100	30	40	40	40
Blackgrass	0	30	10	20	20	0	-	0	0	10	10	30	20	10	10	20	10	25	10	10	10	10
Chickweed	10	45	10	20	60	40	-	50	40	45	10	30	55	95	100	100	95	100	50	50	25	0
Cocklebur	80	90	90	80	90	70	70	60	60	80	30	50	40	100	100	100	100	100	70	80	50	50
Corn	15	10	15	25	20	10	10	10	10	20	20	25	10	25	35	20	20	20	25	20	10	10
Cotton	90	100	100	90	100	90	90	90	70	100	80	90	85	100	100	100	100	100	100	100	80	90
Crabgrass	25	40	30	20	35	20	10	10	10	15	25	25	35	-	30	50	20	50	25	20	15	15
Downy Brome	20	30	10	25	0	0	0	0	0	0	10	20	15	20	0	25	0	0	10	0	0	0
Duck salad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Giant foxtail	25	50	30	35	40	0	10	15	0	20	25	30	25	35	60	50	30	40	25	15	20	15
Italn. Rygrass	25	10	0	20	15	0	0	0	0	0	0	0	20	20	0	15	0	0	0	0	0	0
Johnsongrass	-	25	40	30	30	0	0	0	10	35	20	35	25	20	25	50	20	50	30	30	20	10
Lambsquarter	65	95	100	95	85	40	40	40	30	95	-	-	100	100	100	100	-	100	90	90	95	60
Morningglory	90	100	85	80	90	90	70	-	50	90	40	50	35	100	100	100	100	100	90	90	70	50
Rape	85	95	10	40	70	10	10	20	30	95	75	90	80	100	100	100	100	100	30	35	0	0
Redroot Pigweed	80	100	90	90	80	60	40	20	20	90	100	100	100	100	100	100	90	90	-	100	60	80
Rice Japonica	15	30	15	15	25	0	0	0	0	25	0	25	10	0	20	20	0	0	20	20	15	0
Soybean	30	50	35	50	35	20	25	25	25	20	10	50	25	70	35	35	35	40	25	45	25	25
Speedwell	90	90	100	100	100	70	30	0	0	0	35	80	80	100	100	100	100	100	90	80	30	0

Sugar beet	100	100	100	100	95	-	-	30	60	100	100	100	100	100	100	100	100	100	100	100	40	30
Umbrella sedge	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0
Velvetleaf	100	100	100	100	100	80	80	30	50	100	95	90	100	100	100	100	100	100	100	100	75	30
Watergrass 2	10	30	10	15	15	-	-	-	-	10	0	45	0	0	0	20	-	-	25	10	10	0
Wheat	25	15	25	25	30	0	0	0	0	10	10	40	10	10	10	25	0	25	15	10	0	0
Wild buckwheat	65	75	90	100	95	50	40	50	50	70	50	95	95	100	100	100	70	100	95	95	70	30
Wild oat	30	35	35	25	25	0	20	0	20	10	35	35	30	35	20	25	0	10	15	15	10	0

Table C COMPOUND

Rate 16 g/ha	30	31	32	33	34	35	36	37	39	40	41	42	43	44	45	46	48	49	52	53	54	56
POSTEMERGENCE																						
Barley Igri	25	30	20	25	30	30	20	20	15	20	10	30	15	10	0	0	0	25	30	30	30	25
Barnyard 2	0	0	0	0	0	0	-	-	45	50	0	-	0	0	-	0	0	-	0	0	0	0
Barnyardgrass	90	30	50	15	10	10	10	60	100	80	80	90	75	90	50	35	40	80	100	70	95	35
Bedstraw	50	60	95	90	90	85	100	100	90	100	100	70	75	100	80	0	10	50	85	85	85	85
Blackgrass	10	10	10	10	10	20	25	25	20	30	20	25	10	10	-	0	20	10	20	20	20	10
Chickweed	85	90	100	95	95	80	100	100	100	95	100	100	95	100	-	0	45	80	95	100	95	50
Cocklebur	100	80	100	60	90	50	100	100	90	100	100	100	100	100	100	50	40	90	100	100	100	70
Corn	20	25	20	20	20	10	10	10	35	25	10	20	10	15	10	10	10	20	30	15	15	10
Cotton	100	100	100	90	100	90	100	100	100	100	100	100	100	100	100	100	80	100	100	100	100	70
Crabgrass	20	60	60	20	20	30	10	15	35	50	20	20	20	10	10	20	35	20	20	30	40	40
Downy Brome	0	0	0	10	10	0	10	20	10	30	0	10	15	100	0	0	10	0	20	10	0	10
Duck salad	0	0	0	0	0	0	-	-	0	10	0	-	0	0	-	0	0	-	0	0	0	0
Giant foxtail	25	50	60	20	20	30	10	15	50	50	20	30	40	25	20	20	30	15	30	30	35	30
Italn. Rygrass	10	0	0	10	10	0	10	10	10	35	10	0	10	0	10	0	10	0	10	0	0	10
Johnsongrass	10	30	10	30	40	20	0	10	30	30	20	15	30	35	0	20	-	40	25	30	30	30
Lambsquarter	95	100	100	95	95	90	80	90	100	100	100	100	100	100	100	50	0	85	100	100	100	70
Morningglory	100	90	100	90	90	90	100	100	100	100	100	100	100	100	100	100	80	70	100	100	100	70
Rape	95	70	100	95	95	70	100	100	100	100	100	100	100	100	100	80	80	-	100	100	100	75
Redroot Pigweed	80	80	100	70	80	60	100	100	100	100	100	100	100	100	100	90	40	70	100	85	100	75
Rice Japonica	0	0	0	0	0	0	-	-	30	30	0	-	0	0	-	0	0	-	0	0	0	0
Soybean	40	70	35	60	50	40	70	60	-	35	25	20	30	30	10	30	30	20	50	30	40	40
Speedwell	85	95	100	75	90	90	100	100	100	100	100	100	100	100	100	35	0	85	-	100	100	-

Sugar beet	100	95	100	100	100	100	90	100	100	100	100	100	100	90	-	100	60	100	100	100	100	20
Umbrella sedge	0	0	0	0	0	0	-	-	0	0	0	-	0	0	-	0	0	-	0	0	0	0
Velvetleaf	100	70	100	60	90	85	100	100	100	100	100	100	100	100	100	100	80	100	100	100	100	90
Watergrass 2	10	-	-	-	-	-	-	-	65	50	-	-	-	-	-	0	-	-	-	-	-	-
Wheat	20	20	25	30	35	30	0	0	20	15	20	35	10	0	0	30	0	30	25	20	20	20
Wild buckwheat	100	80	90	90	100	95	100	100	90	100	100	95	100	90	90	70	65	95	100	100	100	95
Wild oat	25	20	25	20	10	35	0	25	20	15	10	0	10	100	0	0	15	10	30	0	20	25

Table C	COMPOUND								
Rate 16 g/ha	57	58	60	64	65	68	69	70	73
POSTEMERGENCE									
Barley Igri	30	0	10	0	10	0	30	0	0
Barnyard 2	0	0	-	0	0	0	0	-	0
Barnyardgrass	60	20	25	40	30	0	60	70	0
Bedstraw	100	65	40	70	40	0	90	60	0
Blackgrass	15	0	10	10	0	0	10	30	0
Chickweed	60	70	90	95	20	0	90	-	0
Cocklebur	100	100	100	100	90	30	100	100	10
Corn	35	10	10	10	5	0	15	40	0
Cotton	100	100	100	100	65	80	100	100	0
Crabgrass	50	20	10	20	10	10	25	40	0
Downy Brome	60	0	10	25	0	0	0	10	0
Duck salad	0	0	-	0	0	0	0	-	0
Giant foxtail	50	20	10	20	15	0	20	60	0
Italn. Rygrass	40	0	0	10	0	0	10	20	0
Johnsongrass	80	20	10	10	20	0	30	50	0
Lambsquarter	95	80	90	85	50	0	65	80	0
Morningglory	100	100	100	100	100	25	100	100	20
Rape	95	100	100	100	100	0	100	100	0
Redroot Pigweed	100	80	100	90	80	50	90	80	10
Rice Japonica	0	0	-	0	0	10	0	-	0
Soybean	90	30	20	30	30	20	50	60	20
Speedwell	-	100	95	90	80	0	100	100	0
Sugar beet	20	100	100	100	-	65	100	-	0
Umbrella sedge	0	0	-	0	0	0	0	-	0
Velvetleaf	100	100	100	100	90	90	100	100	0
Watergrass 2	-	-	-	-	-	-	-	-	-
Wheat	30	0	10	25	0	0	25	15	0
Wild buckwheat	100	100	100	85	100	0	85	80	0
Wild oat	45	0	10	0	0	0	25	0	0

Table C COMPOUND

Rate 16 g/ha	1	2	3	4	5	7	8	9	10	11	12	13	14	20	21	23	24	25	26	27	28	29
PREEMERGENCE																						
Barley Igri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barnyardgrass	0	-	0	0	0	0	0	0	0	-	0	20	0	30	10	10	0	0	0	0	0	0
Bedstraw	0	15	0	0	0	0	0	0	30	20	0	0	0	-	60	100	0	75	0	0	0	0
Blackgrass	0	20	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chickweed	0	40	0	0	0	0	0	0	50	0	0	0	0	100	100	95	65	95	70	35	30	0
Cocklebur	0	0	0	0	0	0	0	0	0	0	0	0	0	90	100	100	10	100	0	10	0	0
Corn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cotton	0	0	20	0	20	0	0	0	0	0	0	0	0	30	100	100	50	100	0	0	10	0
Crabgrass	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0
Downy Brome	0	0	0	0	0	0	0	-	0	0	0	0	0	0	10	0	0	0	0	0	0	0
Giant foxtail	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	10	0	0	0	0	0
Italn. Rygrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0
Johnsongrass	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	0	0	0	0	10	20
Lambsquarter	85	70	90	95	90	30	20	0	0	20	90	100	95	100	100	100	100	100	80	85	25	70
Morningglory	10	50	0	0	0	0	0	0	0	-	0	0	0	100	100	100	30	100	90	0	0	0
Rape	0	0	0	0	0	0	0	0	0	0	0	0	0	80	100	100	10	100	0	0	0	0
Redroot Pigweed	75	25	55	50	0	0	10	0	0	95	40	0	20	100	100	100	100	100	100	90	60	60
Soybean	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	-	0	0	0	0	0	0
Speedwell	100	65	100	100	100	10	0	10	-	0	0	0	0	100	100	95	100	95	0	0	0	-
Sugar beet	90	0	20	90	85	0	0	-	-	70	100	0	95	100	100	100	100	100	10	85	0	0
Velvetleaf	90	0	60	20	50	30	60	0	0	50	10	0	20	100	100	100	100	100	0	20	0	0
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wild buckwheat	0	30	0	0	0	0	0	0	0	0	0	0	0	55	70	75	0	55	0	0	0	20
Wild oat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0

Table C COMPOUND

Rate 16 g/ha	30	31	32	33	34	35	36	37	39	40	41	42	43	44	45	46	48	49	52	53	54	56
PREEMERGENCE																						
Barley Igri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barnyardgrass	0	0	0	0	30	0	0	30	0	10	10	0	10	0	0	0	0	0	20	0	0	30
Bedstraw	0	0	100	0	100	20	30	100	10	70	55	70	70	25	30	0	0	10	10	30	95	90
Blackgrass	0	0	0	0	0	10	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	40
Chickweed	35	15	50	95	95	40	-	-	20	0	85	60	70	95	100	10	0	90	0	90	85	85
Cocklebur	30	0	100	0	0	0	70	60	80	90	70	100	100	10	30	0	0	0	30	80	60	-
Corn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cotton	40	10	100	0	0	0	0	-	20	100	10	100	80	70	20	20	40	0	100	100	90	10
Crabgrass	0	0	20	0	40	0	0	10	0	10	0	0	0	0	0	0	0	0	0	0	0	100
Downy Brome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0
Giant foxtail	10	0	0	0	10	35	0	10	20	10	0	0	10	10	0	0	0	0	0	0	0	100
Italn. Rygrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Johnsongrass	0	0	0	0	0	0	0	30	0	80	0	10	0	0	0	0	0	0	0	0	0	20
Lambsquarter	95	100	100	100	100	100	100	100	100	100	100	100	100	100	100	90	70	95	95	100	100	95
Morningglory	100	60	100	0	0	0	100	100	100	100	50	100	50	100	100	0	0	0	100	-	60	10
Rape	0	0	100	0	0	0	50	90	100	100	100	100	100	100	95	0	0	10	35	30	70	0
Redroot Pigweed	100	90	100	0	70	0	100	100	100	100	90	100	100	100	100	30	10	-	10	80	90	100
Soybean	30	0	0	0	0	0	20	0	0	0	10	0	0	0	0	0	0	0	0	0	0	10
Speedwell	70	95	100	-	100	100	100	100	100	100	100	100	100	100	-	-	100	100	100	-	100	85
Sugar beet	100	100	100	90	100	100	-	-	100	100	100	100	100	100	90	0	60	100	100	100	100	85
Velvetleaf	100	100	100	0	20	10	100	100	100	100	100	100	100	100	100	-	0	30	100	90	100	40
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wild buckwheat	30	10	10	0	15	0	0	60	10	70	25	30	45	0	30	0	0	0	60	30	65	95
Wild oat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C	COMPOUND								
Rate 16 g/ha	57	58	60	64	65	68	69	70	73
PREEMERGENCE									
Barley Igri	40	0	0	0	0	0	0	0	0
Barnyardgrass	90	0	0	0	0	0	0	0	0
Bedstraw	100	0	25	0	-	0	-	100	0
Blackgrass	85	0	0	0	0	10	0	0	10
Chickweed	100	85	95	95	-	100	0	0	0
Cocklebur	70	0	-	-	30	0	0	0	10
Corn	10	0	0	0	0	0	0	0	0
Cotton	95	30	70	-	30	0	30	60	0
Crabgrass	90	0	0	0	0	0	0	0	0
Downy Brome	25	0	0	0	0	0	0	0	0
Giant foxtail	100	0	0	0	0	0	0	0	0
Italn. Rygrass	60	0	0	0	0	0	0	0	0
Johnsongrass	95	0	0	0	0	0	0	10	0
Lambsquarter	100	100	100	100	100	95	100	100	0
Morningglory	-	0	80	100	100	0	70	100	0
Rape	30	0	95	90	0	100	90	100	0
Redroot Pigweed	100	0	100	80	20	-	70	100	0
Soybean	100	0	0	0	0	0	0	10	0
Speedwell	20	100	100	100	0	0	100	-	0
Sugar beet	100	45	80	100	-	0	100	-	0
Velvetleaf	100	10	100	100	100	0	80	70	0
Wheat	30	0	0	0	0	25	0	0	0
Wild buckwheat	100	0	20	0	-	0	0	30	0
Wild oat	65	0	0	0	0	25	0	0	0

Table C COMPOUND

Rate 8 g/ha	1	3	4	5	7	8	9	10	11	12	13	14	20	21	22	23	24	25	26	27	28	29
POSTEMERGENCE																						
Barley Igri	30	30	20	30	0	0	0	10	20	10	35	20	30	10	40	30	0	35	10	10	0	0
Barnyard 2	0	10	15	10	0	0	0	0	25	0	0	0	0	0	-	15	0	0	10	10	10	10
Barnyardgrass	35	20	20	30	0	0	0	0	50	30	20	25	20	60	95	75	20	70	75	40	30	30
Bedstraw	50	50	50	80	30	20	0	20	0	40	20	0	20	-	45	100	95	85	30	40	25	40
Blackgrass	0	0	20	10	0	0	0	0	10	10	25	10	10	10	10	20	0	20	0	10	0	0
Chickweed	0	10	15	50	20	-	20	-	35	10	30	55	80	100	90	100	80	100	50	50	0	0
Cocklebur	50	80	40	85	60	70	40	60	70	20	45	25	80	100	100	100	100	100	50	70	30	50
Corn	10	10	20	15	10	10	10	10	10	15	25	10	25	25	30	15	10	10	15	15	0	0
Cotton	90	100	90	100	90	60	70	-	90	80	85	55	100	100	100	100	100	100	90	90	60	50
Crabgrass	25	30	20	30	10	10	10	10	10	20	25	30	25	30	35	50	15	35	15	20	10	10
Downy Brome	10	10	10	0	0	0	0	0	0	0	20	10	20	0	0	10	0	0	10	0	0	0
Duck salad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0
Giant foxtail	25	25	35	30	0	5	10	0	20	15	30	15	25	40	30	40	20	30	20	10	15	10
Italn. Rygrass	20	0	10	10	0	0	0	0	0	0	0	20	20	0	0	10	0	0	0	0	0	0
Johnsongrass	-	40	20	30	0	0	0	0	10	10	25	10	10	20	40	25	15	20	20	20	10	0
Lambsquarter	60	95	95	85	40	40	20	20	95	-	-	100	100	100	100	100	95	100	90	90	90	35
Morningglory	85	85	75	80	90	40	100	50	80	35	50	30	100	100	100	100	80	100	85	90	40	30
Rape	85	-	30	70	10	10	0	20	80	65	90	60	100	100	100	100	100	100	0	20	0	0
Redroot Pigweed	80	80	90	60	60	40	20	-	90	100	100	100	100	100	100	100	80	90	75	80	60	70
Rice Japonica	10	10	15	25	0	0	0	0	25	0	0	10	0	20	-	20	0	0	20	20	10	0
Soybean	25	35	40	30	20	20	20	20	20	-	50	10	70	35	50	20	25	35	20	40	15	10
Speedwell	90	70	100	-	30	-	0	0	0	30	80	-	95	100	100	-	90	100	85	70	0	0

Sugar beet	100	100	100	95	-	-	-	60	100	100	100	100	90	100	100	100	100	100	95	95	30	0
Umbrella sedge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0
Velvetleaf	100	90	100	100	80	60	0	50	100	95	90	100	100	100	100	100	100	100	100	80	30	20
Watergrass 2	10	10	10	10	-	-	-	-	10	0	0	0	0	0	-	15	-	-	20	10	10	0
Wheat	25	25	25	25	0	0	0	0	10	10	40	0	10	10	25	25	0	20	0	0	0	0
Wild buckwheat	65	90	100	95	30	30	30	40	70	25	85	90	100	100	100	-	70	100	70	70	40	10
Wild oat	25	35	20	20	0	10	0	10	10	10	35	25	30	15	50	15	0	0	10	10	0	0

Table C	COMPOUND																				
Rate 8 g/ha	30	31	32	33	34	35	36	37	39	40	41	42	43	44	45	46	48	49	52	53	54	56
POSTEMERGENCE																						
Barley Igri	20	30	10	25	30	30	10	20	10	10	0	30	10	10	0	0	0	20	30	20	30	25
Barnyard 2	0	0	0	0	0	0	-	-	35	40	0	-	0	0	-	0	0	-	0	0	0	0
Barnyardgrass	80	20	40	10	10	10	10	45	70	80	60	70	30	80	30	25	40	50	70	60	95	15
Bedstraw	50	60	-	80	60	85	100	70	90	80	100	70	40	90	60	0	0	50	50	60	80	85
Blackgrass	10	10	10	0	10	20	10	25	10	25	10	10	0	10	35	0	10	10	10	20	20	10
Chickweed	80	70	100	65	95	70	100	75	90	95	100	95	90	90	-	0	0	60	75	70	90	30
Cocklebur	100	70	100	60	70	30	100	100	90	100	100	100	100	100	100	10	30	50	100	100	100	30
Corn	10	15	15	15	15	10	5	5	20	15	10	15	5	10	5	10	0	10	20	10	10	10
Cotton	95	100	100	80	100	90	100	100	100	100	100	100	100	100	100	90	60	100	100	100	100	70
Crabgrass	15	50	40	10	20	20	10	15	30	30	15	15	20	10	10	10	20	15	20	20	30	10
Downy Brome	0	0	0	10	10	0	0	0	10	10	0	10	10	100	0	0	0	0	10	0	0	10
Duck salad	0	0	0	0	0	0	-	-	0	0	0	-	0	0	-	0	0	-	0	0	0	0
Giant foxtail	20	50	50	10	20	20	10	15	40	35	15	25	20	15	15	10	20	10	25	20	30	20
Italn. Rygrass	0	0	0	10	0	0	0	0	10	20	0	0	0	0	10	0	0	0	10	0	0	10
Johnsongrass	0	20	10	20	30	10	0	10	-	30	15	10	20	25	0	10	-	30	15	30	30	20
Lambsquarter	90	80	100	65	90	80	80	90	100	100	90	95	90	95	100	50	0	70	100	100	100	60
Morningglory	100	90	100	90	90	90	100	100	100	100	100	100	100	100	100	75	70	70	100	100	100	-
Rape	90	30	100	90	60	70	100	100	100	100	100	100	100	100	100	0	25	95	100	100	100	70
Redroot Pigweed	65	60	100	60	80	60	80	100	100	100	100	90	100	100	90	80	30	50	100	70	90	30
Rice Japonica	0	0	0	0	0	0	-	-	25	25	0	-	0	0	-	0	0	-	0	0	0	0
Soybean	35	70	30	50	40	40	70	60	30	35	15	15	25	25	10	20	20	15	50	30	40	20
Speedwell	70	95	90	10	90	75	90	90	100	100	80	95	-	90	100	30	-	75	100	100	100	20

Sugar beet	100	95	100	95	100	100	90	100	100	100	100	100	100	80	-	0	10	100	100	100	100	15
Umbrella sedge	0	0	0	0	0	0	-	-	0	0	0	-	0	0	-	0	0	-	0	0	0	0
Velvetleaf	100	70	100	60	70	-	100	100	100	100	100	100	100	100	100	80	70	90	100	100	100	30
Watergrass 2	10	-	-	-	-	-	-	-	40	40	-	-	-	-	-	0	-	-	-	-	-	-
Wheat	15	0	10	30	35	30	0	0	20	10	10	25	0	0	0	0	0	10	20	10	10	10
Wild buckwheat	95	80	90	75	95	90	90	100	90	100	90	95	100	90	80	30	40	80	100	100	100	95
Wild oat	25	20	10	10	0	30	0	0	10	10	5	0	10	100	0	0	0	0	30	0	0	15

Table C	COMPOUND								
Rate 8 g/ha	57	58	60	64	65	68	69	70	73
POSTEMERGENCE									
Barley Igri	25	0	0	0	10	0	30	0	0
Barnyard 2	0	0	-	0	0	0	0	-	0
Barnyardgrass	30	10	10	30	20	0	50	70	0
Bedstraw	95	65	20	70	40	0	-	-	0
Blackgrass	15	0	0	10	0	0	0	20	0
Chickweed	60	45	70	90	20	0	90	-	0
Cocklebur	80	100	100	90	90	20	100	90	0
Corn	20	10	5	10	5	0	10	30	0
Cotton	100	100	100	100	50	70	100	100	0
Crabgrass	40	20	0	15	10	10	20	35	0
Downy Brome	40	0	0	10	0	0	0	0	0
Duck salad	0	0	-	0	0	0	0	-	0
Giant foxtail	50	15	10	15	10	0	20	35	0
Italn. Rygrass	30	0	0	0	0	0	0	0	0
Johnsongrass	60	10	0	10	0	0	30	40	0
Lambsquarter	95	80	60	85	50	0	65	70	0
Morningglory	90	100	100	100	60	20	100	100	0
Rape	60	100	90	85	100	0	100	100	0
Redroot Pigweed	100	80	90	90	60	40	80	70	0
Rice Japonica	0	0	-	0	0	0	0	-	0
Soybean	80	20	15	20	20	10	50	50	10
Speedwell	95	15	95	50	80	0	100	90	0
Sugar beet	20	55	95	100	-	65	100	-	0
Umbrella sedge	0	0	-	0	0	0	0	-	0
Velvetleaf	100	100	100	100	50	80	90	100	0
Watergrass 2	-	-	-	-	-	-	-	-	-
Wheat	25	0	0	0	0	0	25	10	0
Wild buckwheat	100	85	90	-	100	0	-	80	0
Wild oat	35	0	0	0	0	0	20	0	0

Table C	COMPOUND																				
Rate 8 g/ha	1	3	4	5	7	8	9	10	11	12	13	14	20	21	22	23	24	25	26	27	28	29
PREEMERGENCE																						
Barley Igri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barnyardgrass	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0
Bedstraw	0	0	0	0	0	0	0	20	20	0	0	0	70	-	35	70	0	20	0	0	0	0
Blackgrass	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chickweed	0	0	0	0	0	0	0	50	0	0	0	0	80	50	95	90	55	70	50	35	30	0
Cocklebur	0	0	0	0	0	0	0	0	0	0	0	0	60	100	35	100	10	100	0	0	0	0
Corn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cotton	0	10	0	-	0	0	0	0	0	0	0	0	0	100	20	100	20	100	0	0	0	0
Crabgrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0
Downy Brome	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0
Giant foxtail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Italn. Rygrass	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0
Johnsongrass	0	0	-	0	0	0	0	0	0	0	0	0	10	0	20	0	0	0	0	0	0	0
Lambsquarter	60	90	95	-	0	10	0	0	20	-	100	70	100	100	100	95	100	100	70	85	25	70
Morningglory	0	0	0	0	0	0	0	0	0	0	0	0	100	100	100	60	20	70	10	0	0	0
Rape	0	0	0	0	0	0	0	0	0	0	0	0	35	90	100	100	0	90	0	0	0	0
Redroot Pigweed	60	0	50	0	0	0	0	0	0	20	0	0	70	100	100	100	80	85	80	90	40	50
Soybean	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Speedwell	95	95	100	95	0	0	0	40	0	0	0	0	100	100	100	95	100	95	0	0	0	100
Sugar beet	20	0	45	-	0	0	0	-	10	30	0	-	70	100	100	100	100	100	10	35	0	0
Velvetleaf	50	10	0	20	0	0	0	0	10	0	0	0	85	100	100	100	100	100	0	10	0	0
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wild buckwheat	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	35	0	40	0	0	0	10
Wild oat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C COMPOUND

Rate 8 g/ha	30	31	32	33	34	35	36	37	39	40	41	42	43	44	45	46	48	49	52	53	54	56
PREEMERGENCE																						
Barley Igri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barnyardgrass	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
Bedstraw	0	0	70	0	85	0	0	70	0	20	35	30	70	0	-	0	0	0	0	-	0	75
Blackgrass	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Chickweed	35	0	-	80	90	0	-	-	0	0	85	20	-	-	40	0	0	85	0	80	0	85
Cocklebur	30	0	50	0	0	0	50	-	50	50	30	40	30	10	0	0	0	0	20	30	10	-
Corn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cotton	40	0	60	0	0	0	0	50	20	30	0	60	80	20	0	0	30	0	40	50	40	0
Crabgrass	0	0	20	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	10
Downy Brome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Giant foxtail	0	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	0	0	95
Italn. Rygrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Johnsongrass	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Lambsquarter	95	0	100	100	100	100	100	100	100	100	100	90	100	100	100	25	10	80	95	100	100	90
Morningglory	100	0	50	0	0	0	100	100	100	100	30	80	40	100	100	0	0	0	100	0	30	0
Rape	0	0	90	0	0	0	20	90	100	95	100	35	95	0	50	0	0	0	10	25	70	0
Redroot Pigweed	100	30	90	0	50	0	70	100	100	100	80	100	100	100	40	30	0	0	10	70	90	100
Soybean	30	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0
Speedwell	70	95	100	100	100	100	100	10	95	100	100	100	100	95	0	25	0	100	0	90	100	80
Sugar beet	100	55	90	70	100	-	-	-	100	100	100	100	100	100	90	0	0	95	100	45	100	10
Velvetleaf	100	60	100	0	0	10	100	100	100	100	100	100	100	100	30	0	0	0	60	70	20	10
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wild buckwheat	10	0	0	0	0	0	0	50	0	30	25	0	25	0	20	0	0	0	40	0	0	90
Wild oat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C		COMPOUND							
Rate 8 g/ha	57	58	60	64	65	68	69	70	73
PREEMERGENCE									
Barley Igri	10	0	0	0	0	0	0	0	0
Barnyardgrass	20	0	0	0	0	0	0	0	0
Bedstraw	25	0	20	0	20	0	95	100	0
Blackgrass	60	0	0	0	0	10	0	0	10
Chickweed	35	65	80	95	-	100	0	0	0
Cocklebur	50	0	40	-	15	0	0	0	-
Corn	0	0	0	0	0	0	0	0	0
Cotton	85	0	40	-	10	0	20	30	0
Crabgrass	35	0	0	0	0	0	0	0	0
Downy Brome	0	0	0	0	0	0	0	0	0
Giant foxtail	95	0	0	0	0	0	0	0	0
Italn. Rygrass	30	0	0	0	0	0	0	0	0
Johnsongrass	40	0	0	0	0	0	0	0	0
Lambsquarter	100	100	100	100	100	-	70	95	0
Morningglory	70	0	40	0	100	0	10	0	0
Rape	0	0	0	90	0	100	80	30	0
Redroot Pigweed	100	0	100	-	10	-	50	60	0
Soybean	15	0	0	0	0	0	0	0	0
Speedwell	20	100	100	100	-	0	100	90	0
Sugar beet	100	35	-	100	-	0	100	-	0
Velvetleaf	100	10	100	80	100	0	80	30	0
Wheat	0	0	0	0	0	25	0	0	0
Wild buckwheat	90	0	0	0	0	0	0	10	0
Wild oat	30	0	0	0	0	20	0	0	0

Table C COMPOUND

Rate 4 g/ha	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	39	40	41	42	43
POSTEMERGENCE																						
Barley Igri	20	40	25	0	20	0	0	0	0	20	30	0	10	25	25	10	10	10	10	0	25	0
Barnyard 2	10	-	15	0	0	10	10	10	10	0	0	0	0	0	0	-	-	20	30	0	-	0
Barnyardgrass	60	75	60	10	50	35	30	20	20	60	20	30	10	10	0	10	40	50	70	30	50	25
Bedstraw	40	45	95	80	85	10	10	20	10	30	60	80	40	60	80	40	40	90	80	70	50	-
Blackgrass	10	10	20	0	20	0	10	0	0	10	0	0	0	10	10	0	20	10	25	10	5	0
Chickweed	100	35	90	80	95	30	30	0	0	65	70	95	65	70	45	70	75	70	80	100	85	90
Cocklebur	100	100	100	70	100	30	60	30	30	90	50	100	40	40	20	100	100	90	100	100	100	100
Corn	15	30	10	5	10	10	5	0	0	10	15	10	10	10	10	5	5	15	10	5	10	5
Cotton	100	100	100	90	100	80	90	40	40	90	100	100	80	90	85	90	100	100	100	100	100	100
Crabgrass	25	35	35	10	30	10	10	0	10	10	35	25	10	15	15	10	15	25	30	10	10	10
Downy Brome	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0
Duck salad	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	-	0
Giant foxtail	35	25	40	10	25	10	10	10	10	10	40	40	10	15	15	10	10	30	30	10	15	10
Italn. Rygrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0
Johnsongrass	35	30	15	10	20	10	10	0	0	0	15	5	20	20	10	0	0	15	30	10	5	10
Lambsquarter	100	100	-	90	95	85	90	80	35	80	0	100	45	80	80	80	80	90	100	70	80	80
Morningglory	100	100	100	70	100	85	90	35	25	95	90	100	80	90	90	70	100	100	100	100	100	100
Rape	100	100	95	100	100	0	0	0	0	85	30	100	65	40	10	80	100	95	100	100	100	90
Redroot Pigweed	100	100	100	70	80	70	65	30	50	40	45	100	60	70	50	70	90	100	100	100	85	100
Rice Japonica	0	-	20	0	0	15	20	10	0	0	0	0	0	0	0	-	-	20	25	0	-	0
Soybean	35	40	15	15	25	10	40	0	0	20	50	25	40	40	30	50	50	30	35	10	10	20
Speedwell	100	100	90	90	100	80	0	0	0	60	90	-	10	70	60	90	90	100	95	80	90	-

Sugar beet	100	100	100	95	100	90	95	0	0	100	95	100	-	100	95	80	95	100	100	100	100	100
Umbrella sedge	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	-	0
Velvetleaf	100	100	100	90	100	100	80	20	10	100	60	100	60	70	60	100	100	100	100	100	100	100
Watergrass 2	0	-	15	-	-	10	10	10	0	10	-	-	-	-	-	-	-	25	20	-	-	-
Wheat	20	20	10	0	10	0	0	0	0	0	0	0	10	25	25	0	0	10	10	0	20	0
Wild buckwheat	100	100	100	-	100	70	30	25	10	95	30	90	75	80	90	70	90	90	90	90	90	90
Wild oat	10	40	15	0	0	10	0	0	0	25	20	10	10	0	0	0	0	10	10	0	0	10

Table C	COMPOUND															
Rate 4 g/ha	44	46	48	49	52	53	54	56	57	58	60	64	68	69	70	73
POSTEMERGENCE																
Barley Igri	10	0	0	0	25	10	0	0	25	0	0	0	0	30	0	0
Barnyard 2	0	0	0	-	0	0	0	0	0	0	-	0	0	0	-	0
Barnyardgrass	60	10	20	35	50	30	70	0	10	10	10	10	0	35	40	0
Bedstraw	90	0	0	50	50	60	80	0	95	65	10	50	0	75	30	0
Blackgrass	10	0	0	0	10	0	20	0	10	0	0	0	0	0	10	0
Chickweed	90	0	0	60	30	55	80	0	55	45	40	85	0	85	-	0
Cocklebur	100	0	30	30	100	90	100	-	80	70	100	75	0	100	70	0
Corn	10	0	0	10	15	10	10	0	20	0	0	5	0	5	20	0
Cotton	100	90	50	90	100	100	100	10	80	100	100	100	40	100	80	0
Crabgrass	0	10	10	10	20	10	20	0	15	15	0	10	5	20	35	0
Downy Brome	0	0	0	0	10	0	0	0	10	0	0	10	0	0	0	0
Duck salad	0	0	0	-	0	0	0	0	0	0	-	0	0	0	-	0
Giant foxtail	15	0	10	5	15	15	25	0	20	10	10	10	0	15	35	0
Italn. Rygrass	0	0	0	0	10	0	0	0	25	0	0	0	0	0	0	0
Johnsongrass	15	0	0	20	10	20	20	0	30	10	0	10	0	20	30	0
Lambsquarter	90	50	0	70	100	0	95	0	85	75	45	80	0	60	50	0
Morningglory	100	35	50	-	100	85	100	0	80	50	100	100	20	100	100	0
Rape	100	0	10	95	95	100	100	0	30	95	90	85	0	100	90	0
Redroot Pigweed	100	40	20	40	95	60	80	0	90	70	85	80	30	70	70	0
Rice Japonica	0	0	0	-	0	0	0	0	0	0	-	0	0	0	-	0
Soybean	20	10	10	10	35	25	35	0	50	15	10	10	0	40	40	0
Speedwell	90	-	0	65	100	95	95	0	90	10	60	50	0	100	90	0

Sugar beet	70	0	10	65	100	100	100	0	10	45	95	100	10	80	-	0
Umbrella sedge	0	0	0	-	0	0	0	0	0	0	-	0	0	0	-	0
Velvetleaf	100	60	40	50	100	100	100	0	90	90	100	100	40	90	100	0
Watergrass 2	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wheat	0	0	0	10	10	0	0	0	15	0	0	0	0	25	0	0
Wild buckwheat	-	0	20	60	95	95	100	0	95	65	70	85	0	70	50	0
Wild oat	20	0	0	0	25	0	0	0	30	0	0	0	0	10	0	0

Table C	COMPOUND																				
Rate 4 g/ha	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	39	40	41	42	43
PREEMERGENCE																						
Barley Igri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barnyardgrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bedstraw	0	35	0	0	0	0	0	0	0	0	0	35	0	0	0	0	-	0	0	10	10	0
Blackgrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chickweed	90	60	0	20	70	50	0	30	0	35	0	50	0	90	0	-	-	0	0	85	-	70
Cocklebur	40	0	30	0	90	0	0	0	0	0	0	0	0	0	0	10	30	20	30	0	0	0
Corn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cotton	-	20	50	20	30	0	0	0	0	30	0	30	0	0	0	0	30	15	30	0	10	10
Crabgrass	0	10	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	10	0	0	0
Downy Brome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Giant foxtail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Italn. Rygrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Johnsongrass	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0
Lambsquarter	95	100	95	100	100	70	70	25	70	85	-	100	100	100	95	100	100	100	100	100	70	100
Morningglory	100	100	30	0	10	0	0	0	0	70	-	-	0	0	0	50	100	60	80	20	65	30
Rape	100	0	95	0	70	0	0	0	0	0	0	10	0	0	0	0	30	100	95	0	20	95
Redroot Pigweed	95	100	90	10	40	80	10	20	20	100	0	20	0	40	0	20	100	70	100	10	90	100
Soybean	0	0	0	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0
Speedwell	100	100	85	100	85	0	0	0	65	70	95	100	100	95	100	40	0	95	100	100	100	100
Sugar beet	100	100	100	30	30	10	10	0	0	35	10	90	30	25	100	-	-	100	100	25	70	85
Velvetleaf	100	100	95	30	100	0	0	0	0	30	0	100	0	0	0	100	100	100	100	100	100	35
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wild buckwheat	30	0	-	0	0	0	0	0	0	10	0	0	0	0	0	0	30	0	-	0	0	0
Wild oat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-

Table C	COMPOUND														
Rate 4 g/ha	44	46	48	49	52	53	54	56	57	58	60	64	68	69	70	73
PREEMERGENCE																
Barley Igri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barnyardgrass	0	0	0	0	0	0	0	10	10	0	0	0	0	0	0	0
Bedstraw	0	0	0	0	0	10	0	70	25	0	20	0	0	65	100	0
Blackgrass	0	0	0	0	0	0	0	0	35	0	0	0	0	0	0	10
Chickweed	85	0	0	70	0	20	0	85	35	60	70	95	100	0	0	0
Cocklebur	0	0	0	0	10	-	-	0	10	0	20	20	0	0	0	0
Corn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cotton	20	0	0	0	30	30	30	0	40	0	25	20	0	-	0	0
Crabgrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Downy Brome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Giant foxtail	0	0	0	0	0	0	0	70	25	0	0	0	0	0	0	0
Italn. Rygrass	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0
Johnsongrass	0	0	0	0	0	0	0	10	30	0	0	0	0	0	0	0
Lambsquarter	100	25	10	45	90	100	100	60	95	75	95	100	95	70	90	0
Morningglory	0	0	0	0	100	0	30	0	30	0	20	0	0	0	-	0
Rape	-	0	0	0	0	10	65	0	0	0	0	10	0	10	20	0
Redroot Pigweed	80	0	0	0	10	70	50	35	100	0	100	-	-	0	60	0
Soybean	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Speedwell	-	0	-	85	-	-	90	70	20	95	100	20	0	100	90	0
Sugar beet	100	0	-	10	35	20	90	10	45	10	45	90	0	80	-	0
Velvetleaf	85	0	0	0	-	50	20	0	100	0	30	0	0	30	30	0
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0
Wild buckwheat	0	0	0	0	0	0	0	85	85	0	0	0	0	0	0	0
Wild oat	0	0	0	0	0	0	0	0	20	0	0	0	15	0	0	0

Table C COMPOUND

Rate 2 g/ha	21	22	23	24	25	26	28	30	31	32	33	34	35	39	40	41	42	43	44	46	48	52
POSTEMERGENCE																						
Barley Igri	10	35	10	0	0	0	0	10	10	0	0	20	0	0	0	0	10	0	10	0	0	20
Barnyard 2	0	-	15	0	0	10	10	0	0	0	0	0	0	10	20	0	-	0	0	0	0	0
Barnyardgrass	35	60	50	10	40	20	10	30	10	20	10	10	0	40	40	20	30	20	30	0	20	35
Bedstraw	40	40	85	80	55	0	0	30	30	75	40	40	60	75	80	40	30	-	80	0	0	10
Blackgrass	10	10	10	0	10	0	0	10	0	0	0	0	0	0	20	0	5	0	0	0	0	0
Chickweed	80	20	75	10	70	20	0	60	70	75	65	50	40	60	80	80	65	80	90	0	0	30
Cocklebur	100	80	100	70	100	-	10	40	35	90	30	20	20	90	100	90	100	90	100	0	20	100
Corn	15	25	10	0	0	0	0	0	15	10	5	10	5	10	10	5	5	5	5	0	0	10
Cotton	100	100	100	90	100	60	25	80	90	90	70	80	80	100	100	100	100	100	100	30	40	90
Crabgrass	25	30	25	5	30	10	0	10	25	15	10	15	10	20	30	0	5	0	0	0	0	20
Downy Brome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Duck salad	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0
Giant foxtail	25	20	35	10	20	0	0	0	20	35	10	10	10	25	30	10	10	10	10	0	0	10
Italn. Rygrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Johnsongrass	30	25	10	10	10	10	0	0	10	5	15	10	10	-	20	0	5	0	10	0	0	10
Lambsquarter	100	95	100	70	95	85	40	80	-	95	35	45	50	90	100	70	50	65	90	45	0	95
Morningglory	100	85	100	40	100	65	15	95	80	100	40	70	70	100	100	100	100	90	100	20	20	90
Rape	100	100	95	90	100	0	0	70	30	90	50	40	10	90	90	90	95	90	100	0	10	95
Redroot Pigweed	100	100	100	70	80	35	20	10	40	95	50	60	40	100	90	85	70	100	80	-	10	95
Rice Japonica	0	-	20	0	0	15	10	0	0	0	0	0	0	15	15	0	-	0	0	0	0	0
Soybean	25	35	15	10	20	0	0	15	40	20	30	40	25	30	30	10	5	15	15	0	0	30
Speedwell	70	90	85	10	95	70	0	30	55	80	10	55	20	100	-	60	30	80	75	0	0	0

Sugar beet	100	100	100	70	100	90	0	100	50	55	90	100	30	80	100	100	100	100	60	0	0	100
Umbrella sedge	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0
Velvetleaf	100	100	100	90	100	40	10	70	40	100	20	60	20	100	100	100	100	100	100	30	30	100
Watergrass 2	0	-	10	-	-	10	10	0	-	-	-	-	-	15	20	-	-	-	-	0	-	-
Wheat	0	20	10	0	0	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	10
Wild buckwheat	100	95	100	55	100	45	20	90	30	85	65	75	75	80	90	80	10	80	80	0	20	80
Wild oat	10	35	10	0	0	0	0	10	10	0	0	0	0	10	0	0	0	0	10	0	0	15

Table C	COMPOUND				
Rate 2 g/ha	53	54	56	57	58
POSTEMERGENCE					
Barley Igri	10	0	-	-	0
Barnyard 2	0	0	0	0	0
Barnyardgrass	20	50	-	-	0
Bedstraw	30	70	-	-	50
Blackgrass	0	20	-	-	0
Chickweed	50	75	-	-	35
Cocklebur	75	100	-	-	70
Corn	10	5	-	-	0
Cotton	90	100	-	-	90
Crabgrass	10	20	-	-	10
Downy Brome	0	0	-	-	0
Duck salad	0	0	0	0	0
Giant foxtail	10	25	-	-	5
Italn. Rygrass	0	0	-	-	0
Johnsongrass	10	20	-	-	0
Lambsquarter	0	95	-	-	45
Morningglory	75	70	-	-	30
Rape	95	95	-	-	70
Redroot Pigweed	-	65	-	-	60
Rice Japonica	0	0	0	0	0
Soybean	20	35	-	-	10
Speedwell	90	95	-	-	10
Sugar beet	100	90	-	-	40
Umbrella sedge	0	0	0	0	0
Velvetleaf	80	100	-	-	60
Watergrass 2	-	-	-	-	-
Wheat	0	0	-	-	0
Wild buckwheat	95	95	-	-	65
Wild oat	0	0	-	-	0

Table C

Rate 2 g/ha	COMPOUND 21	22	23	24	25	26	28	30	31	32	33	34	35	39	40	41	42	43	44	46	48	52
PREEMERGENCE																						
Barley Igri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barnyardgrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bedstraw	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blackgrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chickweed	90	0	0	0	65	30	25	35	0	40	0	90	0	0	0	0	-	70	85	0	0	0
Cocklebur	0	0	10	0	10	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	10
Corn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cotton	10	0	-	10	0	0	0	30	0	0	0	0	0	10	30	0	0	0	10	0	0	-
Crabgrass	0	10	0	0	0	0	0	0	0	20	0	0	0	0	10	0	0	0	0	0	0	0
Downy Brome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Giant foxtail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Italn. Rygrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Johnsongrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lambsquarter	90	80	100	25	100	70	25	70	0	100	25	95	0	100	95	100	70	100	95	20	10	90
Morningglory	100	100	20	0	0	0	0	50	0	-	0	0	0	50	65	10	0	0	0	0	0	70
Rape	80	0	10	0	25	0	0	0	0	0	0	0	0	80	20	0	0	90	0	0	0	0
Redroot Pigweed	95	30	80	0	10	40	0	80	0	0	0	40	0	70	95	0	10	50	70	0	0	70
Soybean	0	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Speedwell	100	95	85	45	80	0	0	0	40	100	35	-	0	20	100	100	30	100	-	0	-	0
Sugar beet	95	100	30	0	30	10	0	30	0	30	0	0	15	100	20	0	20	35	45	0	0	0
Velvetleaf	100	30	50	20	35	0	0	20	0	35	0	0	0	60	95	30	100	20	20	0	0	30
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wild buckwheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wild oat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0

Table C		COMPOUND	
Rate 2 g/ha	53	54	58
PREEMERGENCE			
Barley Igri	0	0	0
Barnyardgrass	0	0	0
Bedstraw	0	0	0
Blackgrass	0	0	0
Chickweed	20	0	60
Cocklebur	10	0	0
Corn	0	0	0
Cotton	20	20	0
Crabgrass	0	0	0
Downy Brome	0	0	0
Giant foxtail	0	0	0
Italn. Rygrass	0	0	0
Johnsongrass	0	0	0
Lambsquarter	100	95	0
Morningglory	0	20	0
Rape	0	30	0
Redroot Pigweed	50	50	0
Soybean	0	0	0
Speedwell	85	90	-
Sugar beet	20	25	10
Velvetleaf	40	0	0
Wheat	0	0	0
Wild buckwheat	0	0	0
Wild oat	0	0	0

Table C	COMPOUND			
Rate 1 g/ha	21	22	39	40
POSTEMERGENCE				
Barley Igri	10	30	0	0
Barnyard 2	0	-	0	10
Barnyardgrass	30	50	30	30
Bedstraw	40	30	70	50
Blackgrass	0	10	0	15
Chickweed	20	10	50	70
Cocklebur	90	70	90	100
Corn	10	25	10	10
Cotton	100	90	100	100
Crabgrass	20	25	10	30
Downy Brome	0	0	0	0
Duck salad	0	-	0	0
Giant foxtail	20	10	20	20
Italn. Rygrass	0	0	0	0
Johnsongrass	20	25	10	10
Lambsquarter	30	95	90	100
Morningglory	100	70	95	100
Rape	90	90	90	90
Redroot Pigweed	100	85	100	90
Rice Japonica	0	-	10	10
Soybean	20	35	25	20
Speedwell	70	80	70	75
Sugar beet	100	95	70	100
Umbrella sedge	0	-	0	0
Velvetleaf	100	40	100	100
Watergrass 2	0	-	10	0
Wheat	0	20	0	0
Wild buckwheat	85	90	65	90
Wild oat	0	25	0	0

Table C	COMPOUND			
Rate 1 g/ha	21	22	39	40
PREEMERGENCE				
Barley Igri	0	0	0	0
Barnyardgrass	0	0	0	0
Bedstraw	0	35	0	0
Blackgrass	0	0	0	0
Chickweed	70	0	0	0
Cocklebur	0	0	0	0
Corn	0	0	0	0
Cotton	0	0	10	20
Crabgrass	0	10	0	0
Downy Brome	0	0	0	0
Giant foxtail	0	0	0	0
Italn. Rygrass	0	0	0	0
Johnsongrass	0	0	0	0
Lambsquarter	40	80	20	0
Morningglory	10	40	50	-
Rape	80	0	0	0
Redroot Pigweed	95	30	-	95
Soybean	0	0	0	0
Speedwell	100	95	20	95
Sugar beet	20	10	20	20
Velvetleaf	20	-	60	70
Wheat	0	0	0	0
Wild buckwheat	0	0	0	0
Wild oat	0	0	0	0

TEST D

Seeds of barnyardgrass (*Echinochloa crus-galli*), bindweed (*Concolculus arvensis*), black nightshade (*Solanum ptycanthum dunal*), cassia (*Cassia obtusifolia*), cocklebur (*Xanthium strumarium*), common ragweed (*Ambrosia artemisiifolia*), corn (*Zea mays*), cotton (*Gossypium hirsutam*), crabgrass (*Digitaria spp.*), fall panicum (*Panicum dichotomiflorum*), giant foxtail (*Setaria faberii*), green foxtail (*Setaria viridis*), jimsonweed (*Datura stramonium*), johnsongrass (*Sorghum halepense*), lambsquarter (*Chenopodium album*), morningglory (*Ipomoea spp.*), pigweed (*Amaranthus retroflexus*), prickly sida (*Sida spinosa*), shattercane (*Sorghum vulgare*), signalgrass (*Brachiaria platyphylla*), smartweed (*Polygonum pensylvanicum*), soybean (*Glycine max*), sunflower (*Helianthus annuus*), velvetleaf (*Abutilon theophrasti*), wild proso (*Pancium miliaceum*), woolly cupgrass (*Eriochloa villosa*), yellow foxtail (*Setaria lutescens*) and purple nutsedge (*Cyperus rotundus*) tubers were planted into a sandy loam soil. These crops and weeds were grown in the greenhouse until the plants ranged in height from two to eighteen cm (one to four leaf stage), then treated postemergence with the test chemicals formulated in a non-phytotoxic solvent mixture which included a surfactant. Pots receiving preemergence treatments were planted immediatley prior to test chemical application. Pots treated in this fashion were placed in the greenhouse and maintained according to routine greenhouse procedures.

Treated plants and untreated controls were maintained in the greenhouse approximately 14-21 days after application of the test compound. Visual evaluations of plant injury responses were then recorded. Plant response ratings, summarized in Table D, are reported on a 0 to 100 scale where 0 is no effect and 100 is complete control.

Table D	COMPOUND	
Rate 35 g/ha	20	21
POSTEMERGENCE		
Barnyardgrass	50	100
Bindweed	100	100
Blk Nightshade	100	100
Cassia	70	60
Cocklebur	100	100
Corn	30	20
Cotton	100	100
Crabgrass	50	50
Fall Panicum	60	60
Giant Foxtail	40	50
Green Foxtail	50	60
Jimsonweed	100	100
Johnson Grass	70	40
Lambsquarter	100	100
Morningglory	100	100
Nutsedge	10	10
Pigweed	100	100
Prickly Sida	100	100
Ragweed	100	100
Shattercane	40	90
Signalgrass	50	70
Smartweed	100	100
Soybean	50	40
Sunflower	50	80
Velvetleaf	100	100
Wild Proso	50	30
Woolly cupgrass	35	60
Yellow Foxtail	65	80

Table D	COMPOUND	
Rate 35 g/ha	20	21
PREEMERGENCE		
Barnyardgrass	50	10
Bindweed	-	100
Blk Nightshade	-	100
Cassia	-	100
Cocklebur	-	100
Corn	20	10
Cotton	70	100
Crabgrass	80	20
Fall Panicum	100	40
Giant Foxtail	50	0
Green Foxtail	100	20
Jimsonweed	-	100
Johnson Grass	70	20
Lambsquarter	-	100
Morningglory	-	100
Nutsedge	-	0
Pigweed	-	100
Prickly Sida	-	100
Ragweed	-	100
Shattercane	50	20
Signalgrass	40	20
Smartweed	-	100
Soybean	100	0
Sunflower	70	100
Velvetleaf	-	100
Wild Proso	80	50
Woolly cupgrass	80	30
Yellow Foxtail	50	10

Table D	COMPOUND				
Rate 17 g/ha	20	21	23	25	32
POSTEMERGENCE					
Barnyardgrass	30	100	100	55	60
Bindweed	100	100	100	100	100
Blk Nightshade	100	100	100	100	100
Cassia	70	50	0	50	0
Cocklebur	100	100	100	100	100
Corn	30	5	20	20	15
Cotton	100	100	100	100	100
Crabgrass	30	20	20	30	20
Fall Panicum	50	50	0	10	30
Giant Foxtail	30	40	50	20	50
Green Foxtail	30	50	50	50	50
Jimsonweed	90	100	100	100	100
Johnson Grass	40	5	50	10	40
Lambsquarter	90	100	70	80	100
Morningglory	100	100	100	100	100
Nutsedge	5	5	0	5	0
Pigweed	100	100	100	100	100
Prickly Sida	100	100	100	100	100
Ragweed	100	100	100	100	100
Shattercane	40	50	60	5	50
Signalgrass	30	40	0	5	0
Smartweed	100	100	80	40	60
Soybean	50	20	15	30	20
Sunflower	45	80	95	80	85
Velvetleaf	100	100	100	100	100
Wild Proso	40	30	40	20	60
Woolly cupgrass	10	60	50	30	50
Yellow Foxtail	50	60	50	50	60

Table D	COMPOUND	
Rate 17 g/ha	20	21
PREEMERGENCE		
Barnyardgrass	0	0
Bindweed	-	100
Blk Nightshade	-	100
Cassia	-	0
Cocklebur	-	100
Corn	20	0
Cotton	100	100
Crabgrass	50	0
Fall Panicum	50	20
Giant Foxtail	0	0
Green Foxtail	50	0
Jimsonweed	-	100
Johnson Grass	80	0
Lambsquarter	-	100
Morningglory	-	100
Nutsedge	-	0
Pigweed	-	100
Prickly Sida	-	100
Ragweed	-	100
Shattercane	0	-
Signalgrass	0	0
Smartweed	-	100
Soybean	100	0
Sunflower	10	50
Velvetleaf	-	100
Wild Proso	100	20
Woolly cupgrass	50	30
Yellow Foxtail	50	0

Table D		COMPOUND			
Rate 8 g/ha	20	21	23	25	32
POSTEMERGENCE					
Barnyardgrass	10	90	50	5	40
Bindweed	100	100	100	100	100
Blk Nightshade	-	100	100	100	100
Cassia	50	50	0	5	0
Cocklebur	100	100	100	100	100
Corn	25	5	15	10	15
Cotton	100	100	100	100	100
Crabgrass	10	10	20	10	10
Fall Panicum	30	10	0	5	10
Giant Foxtail	30	30	45	20	50
Green Foxtail	20	20	20	20	20
Jimsonweed	85	100	100	100	100
Johnson Grass	40	5	5	5	20
Lambsquarter	80	100	70	70	80
Morningglory	100	100	100	100	100
Nutsedge	5	0	0	0	0
Pigweed	100	100	100	100	100
Prickly Sida	100	100	100	100	100
Ragweed	100	100	100	100	100
Shattercane	20	10	40	5	30
Signalgrass	30	40	0	5	0
Smartweed	70	70	70	35	60
Soybean	50	5	5	30	15
Sunflower	40	75	85	80	80
Velvetleaf	100	100	100	100	100
Wild Proso	10	10	30	10	40
Woolly cupgrass	10	50	40	10	50
Yellow Foxtail	10	30	15	10	60

Table D	COMPOUND	
Rate 8 g/ha	20	21
PREEMERGENCE		
Barnyardgrass	0	0
Bindweed	-	100
Blk Nightshade	-	100
Cassia	-	0
Cocklebur	-	100
Corn	0	0
Cotton	0	100
Crabgrass	0	0
Fall Panicum	0	0
Giant Foxtail	0	0
Green Foxtail	0	0
Jimsonweed	-	100
Johnson Grass	10	0
Lambsquarter	-	100
Morningglory	-	100
Nutsedge	-	0
Pigweed	-	100
Prickly Sida	-	100
Ragweed	-	100
Shattercane	0	0
Signalgrass	0	0
Smartweed	-	100
Soybean	0	-
Sunflower	0	20
Velvetleaf	-	100
Wild Proso	0	0
Woolly cupgrass	0	10
Yellow Foxtail	0	0

Table D		COMPOUND			
Rate 4 g/ha	20	21	23	25	32
POSTEMERGENCE					
Barnyardgrass	10	40	30	0	10
Bindweed	100	100	100	100	100
Blk Nightshade	70	100	100	100	100
Cassia	50	5	0	5	0
Cocklebur	85	100	100	100	100
Corn	5	5	10	5	10
Cotton	95	100	100	100	100
Crabgrass	5	5	0	5	0
Fall Panicum	10	10	0	5	0
Giant Foxtail	10	30	40	10	40
Green Foxtail	10	5	10	20	5
Jimsonweed	70	70	100	100	100
Johnson Grass	40	5	5	5	5
Lambsquarter	75	90	50	40	30
Morningglory	100	100	100	100	100
Nutsedge	0	0	0	0	0
Pigweed	100	100	100	70	100
Prickly Sida	100	100	100	80	100
Ragweed	70	100	100	100	100
Shattercane	20	5	20	5	30
Signalgrass	10	10	0	0	0
Smartweed	50	60	50	30	40
Soybean	40	5	0	20	0
Sunflower	20	50	80	50	70
Velvetleaf	100	100	100	100	100
Wild Proso	10	5	30	10	10
Woolly cupgrass	5	20	10	5	30
Yellow Foxtail	10	10	5	5	30

Table D	COMPOUND	
Rate 4 g/ha	20	21
PREEMERGENCE		
Barnyardgrass	0	0
Bindweed	-	100
Blk Nightshade	-	100
Cassia	-	0
Cocklebur	-	100
Corn	0	0
Cotton	0	100
Crabgrass	0	0
Fall Panicum	0	0
Giant Foxtail	0	0
Green Foxtail	0	0
Jimsonweed	-	100
Johnson Grass	0	0
Lambsquarter	-	100
Morningglory	-	100
Nutsedge	-	0
Pigweed	-	100
Prickly Sida	-	80
Ragweed	-	100
Shattercane	0	0
Signalgrass	0	0
Smartweed	-	0
Soybean	0	0
Sunflower	0	0
Velvetleaf	-	100
Wild Proso	0	0
Woolly cupgrass	0	0
Yellow Foxtail	0	0

Table D	COMPOUND				
Rate 2 g/ha	20	21	23	25	32
POSTEMERGENCE					
Barnyardgrass	10	10	0	0	0
Bindweed	100	100	100	100	100
Blk Nightshade	60	40	100	20	10
Cassia	20	5	0	5	0
Cocklebur	80	100	100	100	100
Corn	5	0	5	5	0
Cotton	95	80	100	60	100
Crabgrass	5	5	0	5	0
Fall Panicum	5	0	0	5	0
Giant Foxtail	5	10	35	5	20
Green Foxtail	10	5	5	5	5
Jimsonweed	70	70	100	60	70
Johnson Grass	10	0	5	0	5
Lambsquarter	50	85	50	20	30
Morningglory	100	100	100	100	100
Nutsedge	0	0	0	0	0
Pigweed	100	100	100	70	80
Prickly Sida	100	80	70	80	60
Ragweed	60	90	100	80	100
Shattercane	5	5	20	5	20
Signalgrass	0	0	0	0	0
Smartweed	40	40	50	10	40
Soybean	15	0	0	15	0
Sunflower	5	20	80	35	40
Velvetleaf	60	100	100	100	100
Wild Proso	5	5	25	10	5
Woolly cupgrass	5	5	10	5	5
Yellow Foxtail	5	10	5	5	5

Table D	COMPOUND	
Rate 2 g/ha	20	21
PREEMERGENCE		
Barnyardgrass	0	0
Bindweed	-	100
Blk Nightshade	-	70
Cassia	-	0
Cocklebur	-	10
Corn	0	0
Cotton	0	50
Crabgrass	0	0
Fall Panicum	0	0
Giant Foxtail	0	0
Green Foxtail	0	0
Jimsonweed	-	100
Johnson Grass	0	0
Lambsquarter	-	50
Morningglory	-	0
Nutsedge	-	0
Pigweed	-	100
Prickly Sida	-	80
Ragweed	-	50
Shattercane	0	0
Signalgrass	0	0
Smartweed	-	100
Soybean	0	0
Sunflower	0	0
Velvetleaf	-	10
Wild Proso	0	0
Woolly cupgrass	0	0
Yellow Foxtail	0	0

Table D	COMPOUND				
Rate 1 g/ha	20	21	23	25	32
POSTEMERGENCE					
Barnyardgrass	5	0	0	0	0
Bindweed	100	100	100	50	100
Blk Nightshade	50	40	100	-	10
Cassia	5	0	0	0	0
Cocklebur	30	70	100	60	100
Corn	5	0	10	5	0
Cotton	60	80	100	60	100
Crabgrass	5	5	0	5	0
Fall Panicum	5	0	0	0	20
Giant Foxtail	5	5	30	5	15
Green Foxtail	5	5	5	5	5
Jimsonweed	70	20	80	40	60
Johnson Grass	10	0	5	0	5
Lambsquarter	45	50	30	20	5
Morningglory	100	100	100	100	100
Nutsedge	0	0	0	0	0
Pigweed	50	100	100	40	50
Prickly Sida	50	60	100	40	60
Ragweed	55	65	100	50	50
Shattercane	5	5	15	5	5
Signalgrass	0	0	0	0	0
Smartweed	10	20	50	5	20
Soybean	10	0	0	15	0
Sunflower	5	5	75	30	20
Velvetleaf	60	100	100	60	100
Wild Proso	5	5	10	10	5
Woolly cupgrass	5	5	5	5	5
Yellow Foxtail	5	5	5	5	5

Table D	COMPOUND	
Rate 1 g/ha	20	21
PREEMERGENCE		
Barnyardgrass	0	0
Bindweed	-	0
Blk Nightshade	-	30
Cassia	-	0
Cocklebur	-	0
Corn	0	0
Cotton	0	30
Crabgrass	0	0
Fall Panicum	0	0
Giant Foxtail	0	0
Green Foxtail	0	0
Jimsonweed	-	0
Johnson Grass	0	0
Lambsquarter	-	100
Morningglory	-	0
Nutsedge	-	0
Pigweed	-	100
Prickly Sida	-	20
Ragweed	-	0
Shattercane	0	0
Signalgrass	0	0
Smartweed	-	0
Soybean	0	0
Sunflower	0	0
Velvetleaf	-	0
Wild Proso	0	0
Woolly cupgrass	0	0
Yellow Foxtail	0	0

TEST E

Compounds evaluated in this test were formulated in a non-phytoxic solvent mixture which included a surfactant and applied to the soil surface before plant seedlings emerged (preemergence application) and to plants that were in the one-to four leaf stage (postemergence application). A sandy loam soil was used for the preemergence test while a mixture of sandy loam soil and greenhouse potting mix in a 60:40 ratio was used for the postemergence test. Test compounds were applied within approximately one day after planting seeds for the preemergence test.

Plantings of these crops and weed species were adjusted to produce plants of appropriate size for the postemergence test. All plant species were grown using normal greenhouse practices. Crop and weed species include annual bluegrass (*Poa annua*), black nightshade (*Solanum nigra*), blackgrass (Alopecurus grown using normal greenhouse practices. Crop and weed species include annual bluegrass (*Poa annua*), black nightshade (*Solanum nigra*), blackgrass (*Alopecurus myosuroides*), chickweed (*Stellaria media*), deadnettle (*Lamium amplexicaule*), downy brome (*Bromus tectorum*), field violet (*Viola arvensis*), galium (*Galium aparine*), green foxtail (*Setaria viridis*), jointed goatgrass (*Aegilops cylindrica*), kochia (*Kochia scoparia*), lambsquarters (*Chenopodium album*), littleseed canarygrass (*Phalaris minor*), rape (*Brassica napus*), redroot pigweed (*Amaranthus retroflexus*), Russian thistle (*Salsola kali*), ryegrass (*Lolium multiflorum*), sentless chamonile (*Matricaria inodora*), speedwell (*Veronica persica*), spring barely (Hordeum vulgare cv. 'Klages'), spring wheat (Triticum aestivum cv. 'ERA'), sugar beet (Beta vulgaris cv. 'US1'), sunflower (Helianthus annuus cv. 'Russian Giant'), Veronica hederaefolia, wild buckwheat (Polygonum convolvulus), wild mustard (Sinapis arvensis), wild oat (Avena fatua), windgrass (Apera spica-venti), winter barley (Hordeum vulgare cv. 'Igri') and winter wheat (Triticum aestivum cv. 'Talent').

Treated plants and untreated controls were maintained in a greenhouse for approximately 21 to 28 days, after which all treated plants were compared to untreated controls and visually evaluated. Plant response ratings, summarized in Table E, are based upon a 0 to 100 scale where 0 is no effect and 100 is complete control. A dash response (-) means no test result.

Table E	COMPOUND
Rate 62 g/ha	20
POSTEMERGENCE	
Annual Bluegras	-
Blackgrass (2)	-
Blk Nightshade	100
Chickweed	100
Deadnettle	100
Downy brome	-
Field violet	95
Galium (2)	100
Green foxtail	-
Jointed Goatgra	-
Kochia	100
Lambsquarters	100
LS Canarygrass	-
Rape	-
Redroot Pigweed	100
Russian Thistle	-
Ryegrass	-
Scentless Chamo	100
Speedwell	100
Spring Barley	45
Sugar beet	-
Sunflower	-
Veronica hedera	-
Wheat (Spring)	35
Wheat (Winter)	15
Wild buckwheat	100
Wild mustard	-
Wild oat (2)	-
Winter Barley	25

Table E	COMPOUND
Rate 62 g/ha	20
PREEMERGENCE	
Blk Nightshade	100
Chickweed	95
Deadnettle	100
Field violet	75
Galium (2)	100
Kochia	100
Lambsquarters	100
Redroot Pigweed	100
Russian Thistle	-
Scentless Chamo	-
Speedwell	100
Spring Barley	30
Veronica hedera	-
Wheat (Spring)	5
Wheat (Winter)	5
Wild buckwheat	100
Winter Barley	30

Table E	COMPOUND					
Rate 31 g/ha	3	4	5	20	21	23
POSTEMERGENCE						
Annual Bluegras	10	20	20	-	-	-
Blackgrass (2)	10	20	10	-	-	-
Blk Nightshade	100	100	100	100	100	100
Chickweed	20	20	10	100	100	100
Deadnettle	30	20	20	80	100	60
Downy brome	-	-	-	-	-	20
Field violet	50	100	45	95	80	75
Galium (2)	30	50	30	100	100	100
Green foxtail	-	-	-	-	-	100
Jointed Goatgra	-	-	-	-	-	40
Kochia	100	100	100	100	100	100
Lambsquarters	60	65	30	100	100	100
LS Canarygrass	20	30	10	-	-	-
Rape	75	100	50	-	-	100
Redroot Pigweed	60	45	60	100	100	100
Russian Thistle	-	-	-	-	-	-
Ryegrass	-	-	-	-	-	30
Scentless Chamo	50	60	65	-	100	100
Speedwell	75	65	100	100	100	100
Spring Barley	10	15	10	45	20	20
Sugar beet	100	100	100	-	-	100
Sunflower	60	60	50	-	-	100
Veronica hedera	-	-	-	-	-	-
Wheat (Spring)	10	10	10	25	20	20
Wheat (Winter)	10	10	10	10	20	20
Wild buckwheat	100	100	55	100	100	100
Wild mustard	60	80	10	-	-	-
Wild oat (2)	-	-	-	-	-	30
Winter Barley	10	20	10	25	30	30

Table E	COMPOUND			
Rate 31 g/ha	20	21	31	32
PREEMERGENCE				
Blk Nightshade	95	85	65	60
Chickweed	95	45	60	100
Deadnettle	95	15	60	60
Field violet	25	20	30	10
Galium (2)	100	100	75	100
Kochia	90	100	50	45
Lambsquarters	100	100	100	100
Redroot Pigweed	100	100	65	60
Russian Thistle	-	-	100	100
Scentless Chamo	-	-	100	100
Speedwell	90	100	-	-
Spring Barley	10	0	10	10
Veronica hedera	-	-	100	100
Wheat (Spring)	0	0	10	0
Wheat (Winter)	0	5	0	0
Wild buckwheat	100	95	100	100
Winter Barley	5			

Table E COMPOUND

Rate 16 g/ha	3	4	5	12	13	14	20	21	23	25	30	48	52	53	54
POSTEMERGENCE															
Annual Bluegras	10	10	20	-	-	-	-	-	-	-	-	-	-	-	-
Blackgrass (2)	20	20	20	-	-	-	-	-	-	-	-	-	-	-	-
Blk Nightshade	100	100	100	-	-	-	100	100	100	100	100	100	100	100	100
Chickweed	20	10	10	50	-	-	100	100	100	100	30	20	100	75	100
Deadnettle	30	20	30	25	50	30	80	100	80	60	40	20	60	60	45
Downy brome	-	-	-	-	-	-	-	-	20	-	-	-	-	-	-
Field violet	60	60	55	70	70	55	85	100	60	100	100	15	100	100	100
Galium (2)	60	60	35	30	30	30	100	100	100	100	50	30	100	95	100
Green foxtail	-	-	-	-	-	-	-	-	100	-	-	-	-	-	-
Jointed Goatgra	-	-	-	-	-	-	-	-	30	-	-	-	-	-	-
Kochia	100	100	100	100	100	100	100	100	100	100	100	45	100	100	100
Lambsquarters	55	60	30	100	100	70	100	100	100	100	100	40	100	100	100
LS Canarygrass	30	20	20	-	-	-	-	-	-	-	-	-	-	-	-
Rape	75	70	60	-	-	-	-	-	100	-	-	-	-	-	-
Redroot Pigweed	60	50	55	-	-	-	100	100	100	100	100	45	100	100	100
Russian Thistle	-	-	-	100	100	100	-	-	-	-	-	-	-	-	-
Ryegrass	-	-	-	-	-	-	-	-	30	-	-	-	-	-	-
Scentless Chamo	60	50	60	75	50	70	100	80	100	100	70	20	100	100	100
Speedwell	60	60	100	40	20	10	100	100	100	100	100	20	100	100	100
Spring Barley	10	10	10	15	30	10	50	20	20	10	15	5	10	20	20
Sugar beet	100	100	100	-	-	-	-	-	100	-	-	-	-	-	-
Sunflower	-	50	60	-	-	-	-	-	100	-	-	-	-	-	-
Veronica hedera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wheat (Spring)	10	10	10	10	20	5	20	15	20	30	30	5	30	20	30
Wheat (Winter)	10	20	10	10	20	0	10	20	20	20	20	5	30	20	30
Wild buckwheat	100	100	60	60	75	70	85	100	100	100	100	55	100	100	100
Wild mustard	100	100	-	-	-	-	-	-	-	-	-	-	-	-	-
Wild oat (2)	-	-	-	-	-	-	-	-	30	-	-	-	-	-	-
Winter Barley	15	10	10	10	30	5	20	15	20	30	20	10	30	20	30

Table E	COMPOUND								
Rate 16 g/ha	20	21	25	30	31	32	52	53	54
PREEMERGENCE									
Blk Nightshade	95	95	70	50	45	50	65	50	60
Chickweed	95	30	75	30	50	100	50	50	50
Deadnettle	70	10	20	30	30	65	50	30	65
Field violet	0	0	40	20	30	0	10	10	60
Galium (2)	100	100	100	50	25	100	100	60	100
Kochia	100	100	100	30	30	30	50	100	30
Lambsquarters	100	90	100	100	60	60	100	100	100
Redroot Pigweed	85	65	100	100	50	55	100	100	100
Russian Thistle	-	-	10	50	50	30	100	20	95
Scentless Chamo	-	-	100	75	75	75	85	100	50
Speedwell	80	60	-	-	-	-	-	-	-
Spring Barley	10	0	10	10	0	0	10	0	20
Veronica hedera	-	-	100	85	30	65	100	100	100
Wheat (Spring)	0	0	10	10	0	0	20	0	0
Wheat (Winter)	0	0	0	0	0	0	30	0	0
Wild buckwheat	90	80	100	30	60	55	30	75	60
Winter Barley	5	10	30	20	30	10	20	20	10

Table E	COMPOUND																					
Rate 8 g/ha	3	4	5	12	13	14	20	21	23	25	30	32	33	34	35	43	48	49	52	53	54	55
POSTEMERGENCE																						
Annual Bluegras	10	10	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blackgrass (2)	10	20	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blk Nightshade	100	100	100	-	-	-	100	100	100	100	100	100	100	100	100	100	35	100	100	100	100	-
Chickweed	10	10	10	-	-	-	85	100	100	100	20	100	100	100	60	100	20	70	100	60	100	-
Deadnettle	15	10	30	40	40	40	60	60	70	75	30	60	45	65	55	100	10	45	50	50	60	50
Downy brome	-	-	-	-	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-
Field violet	60	55	30	50	60	35	75	70	70	100	100	100	100	100	100	100	10	60	100	100	100	80
Galium (2)	40	35	40	40	30	40	100	100	95	100	30	100	55	100	65	100	30	50	100	95	60	70
Green foxtail	-	-	-	-	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-
Jointed Goatgra	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-
Kochia	100	80	100	100	100	100	100	100	100	100	100	100	100	100	100	100	35	60	100	100	100	100
Lambsquarters	30	50	10	70	100	70	100	100	100	100	100	100	100	100	70	100	30	70	100	70	100	80
LS Canarygrass	20	30	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rape	60	60	55	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-
Redroot Pigweed	30	55	30	-	-	-	100	100	100	100	100	100	100	100	100	100	10	50	100	-	100	-
Russian Thistle	-	-	-	100	100	100	-	-	-	100	-	100	100	100	100	100	-	100	-	-	-	-
Ryegrass	-	-	-	-	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-
Scentless Chamo	30	45	50	60	40	60	70	60	100	65	65	70	60	60	50	100	10	70	65	100	70	70
Speedwell	50	50	65	40	40	0	85	100	100	-	100	-	-	-	-	-	20	-	100	100	100	100
Spring Barley	10	10	10	0	20	0	45	10	10	20	10	20	20	30	30	20	5	15	10	15	20	10
Sugar beet	100	100	100	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunflower	50	40	60	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-
Veronica hedera	-	-	-	-	-	-	-	-	-	95	-	100	60	100	100	100	-	20	-	-	-	-
Wheat (Spring)	10	10	10	10	20	0	20	20	20	20	20	30	30	30	20	20	0	10	20	10	20	10
Wheat (Winter)	10	10	10	0	10	0	5	10	10	20	10	20	25	20	20	20	2	10	20	20	20	15
Wild buckwheat	100	100	50	40	50	60	85	100	100	100	100	100	75	100	100	100	50	100	100	100	100	100
Wild mustard	70	60	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wild oat (2)	-	-	-	-	-	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-
Winter Barley	10	10	10	0	20	0	20	20	15	20	10	30	20	30	30	20	5	10	20	10	20	15

Table E			COMPOUND						
Rate 8 g/ha	20	21	25	30	31	32	52	53	54
PREEMERGENCE									
Blk Nightshade	90	50	20	20	0	30	50	60	50
Chickweed	35	30	75	25	30	70	30	20	30
Deadnettle	10	0	10	20	20	60	10	20	50
Field violet	0	20	10	0	30	20	0	0	30
Galium (2)	80	65	60	40	10	50	100	60	50
Kochia	90	100	30	10	20	20	0	0	-
Lambsquarters	100	90	100	50	70	30	100	100	100
Redroot Pigweed	100	90	100	100	70	30	100	70	100
Russian Thistle	-	-	10	30	30	35	50	20	75
Scentless Chamo	-	-	75	30	70	70	90	70	-
Speedwell	70	50	-	-	-	-	-	-	-
Spring Barley	-	0	0	0	0	0	0	0	10
Veronica hedera	-	-	75	0	70	40	-	65	75
Wheat (Spring)	0	0	0	10	0	0	10	0	0
Wheat (Winter)	0	0	0	0	0	0	20	0	0
Wild buckwheat	85	50	55	-	10	30	50	30	50
Winter Barley	0	10	20	20	0	0	25	0	10

Table E

Rate 4 g/ha	12	13	14	20	21	23	25	30	31	32	33	34	35	43	48	52	53	54	55
	COMPOUND																		
POSTEMERGENCE																			
Annual Bluegras	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blackgrass (2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blk Nightshade	-	-	-	100	100	100	100	100	100	100	100	100	100	100	20	100	100	100	70
Chickweed	10	-	-	75	100	100	100	25	50	100	50	65	40	100	20	100	50	60	-
Deadnettle	50	50	30	40	65	45	50	20	30	50	50	50	50	100	10	30	40	35	50
Downy brome	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-
Field violet	40	50	30	30	65	60	100	60	75	100	75	100	100	100	5	100	65	100	60
Galium (2)	30	20	30	60	100	95	70	10	30	50	50	-	50	100	20	95	30	30	60
Green foxtail	-	-	-	-	-	70	-	-	-	-	-	-	-	-	-	-	-	-	-
Jointed Goatgra	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-
Kochia	100	70	50	100	100	100	100	100	60	100	70	100	100	100	10	100	100	100	70
Lambsquarters	70	100	60	85	100	75	100	70	70	100	70	100	70	100	10	100	75	70	70
LS Canarygrass	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rape	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-
Redroot Pigweed	-	-	-	90	100	100	100	100	100	100	100	100	100	100	5	100	100	100	-
Russian Thistle	70	100	100	-	-	-	100	-	100	100	100	100	100	100	-	-	-	-	-
Ryegrass	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-
Scentless Chamo	30	30	50	70	55	100	60	50	50	65	65	50	40	100	5	65	65	60	70
Speedwell	30	10	0	60	100	100	-	35	-	-	-	-	-	-	10	100	100	60	70
Spring Barley	10	15	0	45	10	10	10	10	15	20	20	20	20	15	2	10	10	20	0
Sugar beet	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunflower	-	-	-	-	-	80	-	-	-	-	-	-	-	-	-	-	-	-	-
Veronica hedera	-	-	-	-	-	-	55	-	50	50	50	60	50	100	-	-	-	-	-
Wheat (Spring)	10	15	0	5	5	10	10	10	20	20	20	20	20	15	0	10	10	10	5
Wheat (Winter)	20	0	0	5	10	10	10	10	15	10	20	15	15	15	0	10	10	10	5
Wild buckwheat	40	65	50	85	100	100	100	100	65	100	60	100	100	100	20	100	100	50	100
Wild mustard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wild oat (2)	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-
Winter Barley	0	15	0	25	20	10	10	10	20	20	20	20	20	20	5	10	20	15	5

Table E		COMPOUND					
Rate 4 g/ha	20	21	25	30	52	53	54
PREEMERGENCE							
Blk Nightshade	15	50	30	10	0	30	0
Chickweed	0	15	70	20	50	0	10
Deadnettle	0	10	10	10	30	20	30
Field violet	0	20	0	0	0	0	0
Galium (2)	10	-	30	0	100	60	0
Kochia	5	85	95	30	100	0	0
Lambsquarters	100	100	100	30	70	100	50
Redroot Pigweed	5	50	100	40	60	-	100
Russian Thistle	-	-	0	-	0	10	10
Scentless Chamo	-	-	70	75	100	0	0
Speedwell	10	-	-	-	-	-	-
Spring Barley	5	0	0	10	0	0	0
Veronica hedera	-	-	100	0	100	60	100
Wheat (Spring)	0	10	10	0	20	10	0
Wheat (Winter)	0	0	0	0	0	0	0
Wild buckwheat	20	60	40	-	40	0	0
Winter Barley	0	15	20	20	25	10	20

Table E COMPOUND

Rate 2 g/ha	20	21	23	25	31	32	33	34	35	43	49	52	54	55
POSTEMERGENCE														
Annual Bluegras	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blackgrass (2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blk Nightshade	100	100	100	100	60	100	100	100	70	100	60	100	100	80
Chickweed	30	75	100	65	20	50	30	50	30	60	20	-	-	-
Deadnettle	40	65	40	40	40	30	45	55	40	40	30	50	50	30
Downy brome	-	-	5	-	-	-	-	-	-	-	-	-	-	-
Field violet	35	40	50	75	70	100	65	100	100	100	30	50	70	50
Galium (2)	30	100	65	50	30	45	25	60	30	30	20	50	70	50
Green foxtail	-	-	25	-	-	-	-	-	-	-	-	-	-	-
Jointed Goatgra	-	-	10	-	-	-	-	-	-	-	-	-	-	-
Kochia	100	100	100	70	40	70	70	70	65	100	40	100	100	50
Lambsquarters	100	100	75	75	60	100	60	70	60	100	50	100	90	30
LS Canarygrass	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rape	-	-	100	-	-	-	-	-	-	-	-	-	-	-
Redroot Pigweed	100	100	100	100	100	100	100	100	100	100	30	100	100	-
Russian Thistle	-	-	-	100	70	100	100	100	100	100	50	-	-	-
Ryegrass	-	-	10	-	-	-	-	-	-	-	-	-	-	-
Scentless Chamo	30	55	70	50	50	60	50	30	30	65	30	50	60	60
Speedwell	55	100	60	-	-	-	-	-	-	-	-	100	60	60
Spring Barley	15	5	10	10	10	10	10	10	15	10	10	5	5	0
Sugar beet	-	-	100	-	-	-	-	-	-	-	-	-	-	-
Sunflower	-	-	50	-	-	-	-	-	-	-	-	-	-	-
Veronica hedera	-	-	-	60	50	50	60	50	50	60	10	-	-	-
Wheat (Spring)	20	5	10	5	10	10	10	20	10	10	5	5	5	5
Wheat (Winter)	15	5	10	10	10	10	10	10	10	10	0	5	5	0
Wild buckwheat	100	100	100	100	55	100	30	65	70	100	50	100	100	60
Wild mustard	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wild oat (2)	-	-	10	-	-	-	-	-	-	-	-	-	-	-
Winter Barley	20	10	10	10	10	10	20	20	20	10	10	5	5	0

Table E		COMPOUND
Rate 2 g/ha	20	21
PREEMERGENCE		
Blk Nightshade	0	50
Chickweed	0	0
Deadnettle	0	10
Field violet	-	10
Galium (2)	0	50
Kochia	0	100
Lambsquarters	15	80
Redroot Pigweed	0	70
Russian Thistle	-	-
Scentless Chamo	0	-
Speedwell	0	15
Spring Barley	0	0
Veronica hedera	-	-
Wheat (Spring)	0	10
Wheat (Winter)	0	0
Wild buckwheat	0	30
Winter Barley	0	10

Table E			COMPOUND			
Rate 1 g/ha	25	31	32	52	54	55
POSTEMERGENCE						
Annual Bluegras	-	-	-	-	-	-
Blackgrass (2)	-	-	-	-	-	-
Blk Nightshade	100	60	100	100	100	30
Chickweed	50	10	50	-	-	-
Deadnettle	30	30	30	20	50	30
Downy brome	-	-	-	-	-	-
Field violet	70	50	65	50	60	30
Galium (2)	30	50	20	40	50	50
Green foxtail	-	-	-	-	-	-
Jointed Goatgra	-	-	-	-	-	-
Kochia	75	35	100	80	70	40
Lambsquarters	70	60	60	70	90	20
LS Canarygrass	-	-	-	-	-	-
Rape	-	-	-	-	-	-
Redroot Pigweed	100	100	100	100	100	30
Russian Thistle	100	70	75	-	-	-
Ryegrass	-	-	-	-	-	-
Scentless Chamo	30	55	55	50	-	20
Speedwell	-	-	-	50	50	50
Spring Barley	5	5	5	5	0	0
Sugar beet	-	-	-	-	-	-
Sunflower	-	-	-	-	-	-
Veronica hedera	-	30	50	-	-	-
Wheat (Spring)	5	5	10	5	5	5
Wheat (Winter)	5	5	2	5	0	0
Wild buckwheat	100	45	55	20	60	50
Wild mustard	-	-	-	-	-	-
Wild oat (2)	-	-	-	-	-	-
Winter Barley	10	10	10	5	0	0

TEST F

Compounds evaluated in this test were formulated in a non-phytoxic solvent mixture which included a surfactant and applied to the soil surface before plant seedlings emerged (preemergence application) and to plants that were grown for various periods of time before treatment (postemergence application). A sandy loam soil was used for the preemergence test while a mixture of sandy loam soil and greenhouse potting mix in a 60:40 ratio was used for the postemergence test. Test compounds were applied within approximately one day after planting seeds for the preemergence test.

Plantings of these crops and weed species were adjusted to produce plants of appropriate size for the postemergence test. All plant species were grown using normal greenhouse practices. Crop and weed species include annual bluegrass (*Poa annua*), black nightshade (*Solanum nigra*), blackgrass (*Alopecurus myosuroides*), chickweed (*Stellaria media*), deadnettle (*Lamium amplexicaule*), downy brome (*Bromus tectorum*), field violet (*Viola arvensis*), galium (*Galium aparine*), green foxtail (*Setaria viridis*), jointed goatgrass (*Aegilops cylindrica*), kochia (*Kochia scoparia*), lambsquarters (*Chenopodium album*), littleseed canarygrass (*Phalaris minor*), rape (*Brassica napus*), redroot pigweed (*Amaranthus retroflexus*), Russian thistle (*Salsola kali*), ryegrass (*Lolium multiflorum*), sentless chamonile (*Matricaria inodora*), speedwell (*Veronica persica*), spring barely (Hordeum vulgare cv. 'Klages'), spring wheat (Triticum aestivum cv. 'ERA'), sugar beet (Beta vulgaris cv. 'US1'), sunflower (Helianthus annuus cv. 'Russian Giant'), Veronica hederaefolia, wild buckwheat (Polygonum convolvulus), wild mustard (Sinapis arvensis), wild oat (Avena fatua), windgrass (Apera spica-venti), winter barley (Hordeum vulgare cv. 'Igri') and winter wheat (Triticum aestivum cv. 'Talent').

Treated plants and untreated controls were maintained in a greenhouse for approximately 21 to 28 days, after which all treated plants were compared to untreated controls and visually evaluated. Plant response ratings, summarized in Table F, are based upon a 0 to 100 scale where 0 is no effect and 100 is complete control. A dash response (-) means no test result.

Table F	COMPOUND								
Rate 35 g/ha	23	25	30	48	52	53	54	60	71
POSTEMERGENCE									
Arrowleaw Sida	100	100	75	45	100	100	100	70	25
Barnyardgrass	40	40	15	15	35	25	50	55	15
Cocklebur	100	100	75	25	100	100	100	100	25
Common Ragweed	100	100	100	30	100	100	100	85	40
Corn	25	10	10	5	10	15	10	20	10
Cotton	100	100	100	100	100	100	100	100	100
Estrn Blknight	100	100	95	25	100	100	100	100	85
Fall Panicum	45	25	15	15	20	15	20	20	10
Field Bindweed	100	100	100	70	100	100	100	100	35
Fl Beggarweed	65	85	80	20	80	100	75	70	40
Giant Foxtail	40	35	10	10	40	20	30	25	15
Hairy Beggartic	100	100	100	25	100	100	100	100	35
Ivyleaw Mrnglry	100	100	100	85	85	100	100	100	20
Johnsongrass	30	25	15	5	15	20	15	20	5
Ladysthumb	100	60	60	20	90	50	65	90	20
Lambsquarters	100	100	95	30	100	-	-	80	65
Large Crabgrass	30	20	15	15	25	25	25	15	10
Purple Nutsedge	15	5	0	0	0	0	0	10	5
Redroot Pigweed	100	100	100	80	100	100	100	100	100
Soybean	40	50	75	20	60	45	30	35	15
Surinam Grass	25	30	10	15	30	25	30	45	15
Velvetleaf	100	100	100	50	100	100	100	90	40
Wild Poinsettia	100	100	100	65	100	100	100	100	100

Table F			COMPOUND					
Rate 35 g/ha	23	25	30	48	52	53	54	71
PREEMERGENCE								
Arrowleaw Sida	100	100	65	0	100	100	100	15
Barnyardgrass	10	10	0	0	0	10	15	0
Cocklebur	30	100	100	0	100	100	95	0
Common Ragweed	100	100	100	15	100	100	100	45
Corn	0	0	0	0	0	0	0	0
Cotton	100	30	45	0	100	100	100	10
Estrn Blknight	-	100	100	20	100	100	100	90
Fall Panicum	50	10	15	0	10	0	15	25
Field Bindweed	-	100	100	10	100	100	100	0
Fl Beggarweed	-	100	40	0	100	100	100	20
Giant Foxtail	20	10	0	0	20	15	10	10
Hairy Beggartic	100	100	100	0	100	100	100	15
Ivyleaw Mrnglry	100	100	75	0	100	100	100	15
Johnsongrass	-	0	0	0	0	0	0	0
Ladysthumb	-	100	0	0	100	95	100	35
Lambsquarters	100	100	100	0	100	100	100	100
Large Crabgrass	0	0	0	0	0	15	10	10
Purple Nutsedge	0	0	0	0	0	0	0	0
Redroot Pigweed	100	100	100	15	100	100	100	50
Soybean	0	0	10	0	20	15	20	10
Surinam Grass	10	0	0	0	0	0	5	0
Velvetleaf	100	100	100	0	100	100	100	35
Wild Poinsettia	100	100	45	0	100	100	100	-

Table F COMPOUND

Rate 17 g/ha	21	22	23	25	30	32	39	40	48	52	53	54	60	64	69	71
POSTEMERGENCE																
Arrowleaw Sida	100	100	100	85	35	100	100	100	20	100	90	100	70	-	10	10
Barnyardgrass	40	35	30	25	10	15	65	65	5	25	20	55	55	85	40	10
Cocklebur	100	100	100	100	-	100	100	100	0	100	100	100	100	100	100	15
Common Ragweed	100	100	100	100	100	100	100	100	15	100	100	100	70	100	85	35
Corn	20	25	20	10	10	15	15	15	0	15	10	10	15	20	20	5
Cotton	100	100	100	100	100	100	100	100	65	100	100	100	100	100	100	100
Estrn Blknight	100	100	90	100	75	100	100	100	0	100	100	100	100	100	100	35
Fall Panicum	40	35	30	10	10	60	35	35	10	10	10	15	20	20	5	5
Field Bindweed	100	100	100	100	100	100	100	100	20	100	100	100	100	100	100	25
Fl Beggarweed	100	100	50	70	75	70	90	85	15	70	80	70	60	80	15	35
Giant Foxtail	45	30	25	20	5	20	30	35	5	25	15	25	25	25	10	10
Hairy Beggartic	100	100	100	65	85	100	100	100	5	100	100	100	100	100	100	20
Ivyleaw Mrnglry	100	100	100	75	35	100	100	100	25	75	100	100	100	100	100	10
Johnsongrass	30	30	25	20	10	15	30	35	5	10	10	15	15	10	10	0
Ladysthumb	100	90	90	50	55	100	100	100	0	60	45	35	80	20	40	15
Lambsquarters	95	85	100	90	90	100	100	100	15	100	-	-	70	95	50	55
Large Crabgrass	20	25	15	15	10	15	30	35	10	20	15	20	15	50	10	10
Purple Nutsedge	65	30	0	0	0	10	0	0	0	0	0	0	0	0	0	0
Redroot Pigweed	100	100	100	100	100	100	-	-	75	100	100	100	100	100	90	100
Soybean	45	50	-	50	30	15	45	50	5	35	40	25	20	50	60	5
Surinam Grass	25	35	15	25	5	15	25	30	10	20	20	25	40	25	10	10
Velvetleaf	100	100	100	100	100	100	100	100	15	100	100	100	90	100	100	25
Wild Poinsettia	100	100	100	100	80	100	100	100	10	100	100	100	100	100	100	60

Table F COMPOUND

Rate 17 g/ha	21	22	23	25	30	32	39	40	48	52	53	54	71
PREEMERGENCE													
Arrowleaw Sida	100	100	100	65	50	90	100	100	0	100	100	100	0
Barnyardgrass	10	0	0	0	0	10	0	0	0	0	5	10	0
Cocklebur	100	0	-	100	25	60	100	100	0	100	45	50	0
Common Ragweed	100	40	70	100	75	100	100	100	5	100	100	100	0
Corn	0	10	0	0	0	10	0	0	0	0	0	0	0
Cotton	100	50	100	15	35	75	100	100	0	100	45	100	0
Estrn Blknight	-	-	-	100	100	100	-	-	10	100	100	100	55
Fall Panicum	0	30	10	0	0	0	40	15	0	0	0	0	10
Field Bindweed	100	-	-	100	70	100	100	100	0	100	100	100	0
Fl Beggarweed	0	-	-	100	25	10	100	100	0	100	100	100	0
Giant Foxtail	35	20	0	0	0	0	25	10	0	0	0	0	0
Hairy Beggartic	100	-	100	70	100	85	100	100	0	60	90	100	0
Ivyleaw Mrnglry	90	10	100	100	50	100	55	30	0	100	100	100	0
Johnsongrass	0	0	0	0	0	0	0	0	0	0	0	-	0
Ladysthumb	-	-	-	50	0	0	75	100	0	50	0	100	0
Lambsquarters	100	100	100	100	100	100	-	-	0	100	100	100	35
Large Crabgrass	20	60	0	0	0	10	15	10	0	0	0	5	0
Purple Nutsedge	-	-	-	0	0	0	0	0	0	0	0	0	0
Redroot Pigweed	100	100	100	100	75	100	100	100	0	100	100	100	10
Soybean	20	0	0	0	0	10	0	0	0	-	5	10	0
Surinam Grass	10	15	0	0	0	0	10	10	0	0	0	0	0
Velvetleaf	100	100	100	100	90	100	100	100	0	100	100	100	0
Wild Poinsettia	100	-	55	45	35	100	100	100	0	80	80	100	20

Table F	COMPOUND												
Rate 8 g/ha	21	22	23	25	30	32	39	40	48	52	53	54	71
PREEMERGENCE													
Arrowleaw Sida	15	90	25	40	15	75	100	100	0	35	100	100	0
Barnyardgrass	10	0	0	0	0	0	0	0	0	0	0	0	0
Cocklebur	100	-	15	100	0	-	15	15	0	35	0	20	0
Common Ragweed	50	35	-	60	50	90	100	50	0	50	100	80	0
Corn	0	0	0	0	0	0	0	0	0	0	0	0	0
Cotton	100	-	10	0	15	45	100	100	0	40	-	100	0
Estrn Blknight	-	-	-	100	95	40	-	-	0	95	100	100	30
Fall Panicum	0	0	0	0	0	0	10	10	0	0	0	0	0
Field Bindweed	100	-	-	100	40	100	100	100	0	100	100	100	0
Fl Beggarweed	-	-	-	100	10	10	100	85	0	60	25	100	0
Giant Foxtail	15	0	0	0	0	0	10	0	0	0	0	0	0
Hairy Beggartic	30	45	100	60	85	30	100	100	0	35	55	100	0
Ivyleaw Mrnglry	45	0	100	55	15	70	25	0	0	100	70	80	0
Johnsongrass	0	0	0	0	0	0	0	0	0	0	0	0	0
Ladysthumb	-	-	0	35	-	-	65	100	0	10	0	100	0
Lambsquarters	100	100	100	100	70	100	-	-	0	95	100	100	15
Large Crabgrass	15	25	0	0	0	0	10	0	0	0	0	0	0
Purple Nutsedge	-	0	-	0	0	0	0	0	0	0	0	0	0
Redroot Pigweed	100	100	100	100	60	85	100	100	0	100	100	100	0
Soybean	10	0	0	0	0	10	0	0	0	0	5	0	0
Surinam Grass	10	0	0	0	0	0	0	0	0	0	0	0	0
Velvetleaf	100	100	100	100	35	100	100	100	0	75	100	100	0
Wild Poinsettia	100	-	-	-	20	100	35	55	0	75	80	100	0

Table F COMPOUND

Rate 8 g/ha	21	22	23	25	30	32	39	40	48	52	53	54	60	64	69	71
POSTEMERGENCE																
Arrowleaw Sida	80	100	50	80	20	100	95	100	0	35	85	95	50	0	0	0
Barnyardgrass	35	25	15	15	0	10	35	40	0	15	10	15	50	60	30	0
Cocklebur	100	100	100	100	40	100	100	100	0	100	90	100	80	100	75	10
Common Ragweed	100	100	100	100	100	100	100	100	10	100	100	100	70	100	75	20
Corn	15	15	15	10	5	15	15	15	0	10	10	5	10	20	20	5
Cotton	100	100	100	100	95	100	100	100	30	100	100	100	80	100	95	45
Estrn Blknight	100	100	85	90	65	100	100	100	0	100	100	100	70	100	100	25
Fall Panicum	20	20	15	5	10	55	25	20	5	10	10	10	20	10	5	5
Field Bindweed	100	100	100	100	90	100	100	100	0	100	100	100	45	100	100	10
Fl Beggarweed	100	100	50	65	65	-	75	75	10	65	50	60	60	65	10	25
Giant Foxtail	25	20	10	10	0	20	20	20	0	15	10	15	20	15	10	0
Hairy Beggartic	100	95	100	55	50	100	100	100	0	100	95	100	75	100	65	0
Ivyleaw Mrnglry	100	100	100	65	20	100	100	100	10	70	100	100	85	100	50	0
Johnsongrass	25	25	15	15	10	10	25	25	0	0	10	10	10	10	10	0
Ladysthumb	75	65	45	35	40	100	70	100	0	45	40	20	70	80	40	10
Lambsquarters	80	85	100	90	80	80	100	100	10	100	-	-	65	95	30	40
Large Crabgrass	15	15	5	15	10	15	15	20	5	15	10	15	10	20	10	5
Purple Nutsedge	45	20	0	0	0	10	0	0	0	0	0	0	0	0	0	0
Redroot Pigweed	100	100	100	100	100	100	-	-	45	100	100	100	75	100	75	35
Soybean	40	45	30	40	10	15	35	35	5	30	35	20	-	30	50	5
Surinam Grass	20	30	10	20	0	15	15	25	0	15	15	15	30	5	10	0
Velvetleaf	100	100	100	100	60	100	100	100	0	100	100	100	65	100	100	0
Wild Poinsettia	100	100	100	100	70	100	100	100	0	100	100	100	100	100	100	45

Table F COMPOUND

Rate 4 g/ha	21	22	23	25	30	32	39	40	48	52	53	54	60	64	69	71
POSTEMERGENCE																
Arrowleaw Sida	75	55	20	25	10	60	90	75	0	25	55	90	50	0	0	0
Barnyardgrass	20	20	10	10	0	10	20	20	0	0	10	15	45	10	10	0
Cocklebur	100	100	100	100	25	85	100	100	0	90	80	100	75	100	75	0
Common Ragweed	100	95	100	100	50	100	100	100	0	100	100	100	60	20	0	0
Corn	10	10	15	5	5	10	10	10	0	10	5	5	10	10	15	0
Cotton	100	100	100	100	95	100	100	100	25	100	100	100	75	90	80	35
Estrn Blknight	100	100	80	85	30	100	100	100	0	80	95	95	60	100	80	10
Fall Panicum	10	15	5	5	5	40	15	10	0	0	5	5	15	5	5	0
Field Bindweed	100	100	100	100	45	100	100	100	0	100	55	100	40	95	90	0
Fl Beggarweed	60	100	30	45	30	50	70	60	0	60	30	35	50	55	10	0
Giant Foxtail	20	15	5	10	0	15	15	15	0	10	10	10	15	5	5	0
Hairy Beggartic	100	60	100	40	25	80	95	100	0	65	75	100	70	100	65	0
Ivyleaw Mrnglry	100	100	100	50	15	100	100	100	0	25	60	100	85	100	75	0
Johnsongrass	10	15	10	10	5	10	15	20	0	0	5	5	10	5	10	0
Ladysthumb	50	-	45	30	25	25	40	60	0	30	30	20	70	20	40	5
Lambsquarters	60	75	100	85	70	70	100	100	5	70	-	-	60	80	20	20
Large Crabgrass	10	10	5	10	5	15	10	15	0	10	5	10	10	20	10	5
Purple Nutsedge	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Redroot Pigweed	100	100	100	100	40	100	-	-	10	100	100	100	75	100	50	15
Soybean	35	35	25	30	0	10	25	30	0	20	10	15	15	30	50	0
Surinam Grass	15	25	5	15	0	15	10	20	0	10	10	10	20	5	10	0
Velvetleaf	100	100	100	60	35	100	100	100	0	100	100	100	45	100	100	0
Wild Poinsettia	100	100	100	100	25	100	100	100	0	90	100	100	100	100	100	0

Table F	COMPOUND												
Rate 4 g/ha	21	22	23	25	30	32	39	40	48	52	53	54	71
PREEMERGENCE													
Arrowleaw Sida	-	0	0	35	10	75	35	95	0	20	100	100	0
Barnyardgrass	0	0	0	0	0	0	0	0	0	0	0	0	0
Cocklebur	20	-	0	20	0	50	0	0	0	10	0	0	0
Common Ragweed	35	35	-	40	20	55	35	25	0	-	95	60	0
Corn	0	0	0	0	0	0	0	0	0	0	0	0	0
Cotton	20	35	0	0	0	35	100	0	0	25	0	15	0
Estrn Blknight	-	-	-	100	90	40	-	-	0	75	100	100	25
Fall Panicum	0	0	0	0	0	0	0	10	0	0	0	0	0
Field Bindweed	100	0	-	40	0	100	100	100	0	90	100	100	0
Fl Beggarweed	0	-	0	50	0	10	85	-	0	40	-	100	0
Giant Foxtail	10	0	0	0	0	0	0	0	0	0	0	0	0
Hairy Beggartic	-	-	50	45	15	30	100	100	0	-	20	100	0
Ivyleaw Mrnglry	0	0	10	30	0	60	15	0	0	50	50	55	0
Johnsongrass	0	0	0	0	0	0	0	0	0	0	0	0	0
Ladysthumb	-	-	0	-	-	-	15	45	0	0	-	100	0
Lambsquarters	100	40	95	100	50	100	-	-	0	70	100	95	0
Large Crabgrass	15	10	0	0	0	0	0	0	0	0	0	0	0
Purple Nutsedge	-	0	0	0	0	0	0	0	0	0	0	0	0
Redroot Pigweed	100	100	100	100	50	55	85	100	0	65	90	100	0
Soybean	0	0	0	0	0	10	0	0	0	0	0	0	0
Surinam Grass	0	0	0	0	0	0	0	0	0	0	0	0	0
Velvetleaf	100	35	60	85	10	100	100	65	0	60	75	85	0
Wild Poinsettia	65	-	25	0	0	85	25	30	0	20	70	100	0

Table F

Rate 2 g/ha	21	22	23	25	30	32	39	40	48	52	53	54	64	69	71
POSTEMERGENCE															
Arrowleaw Sida	70	50	15	15	0	45	70	35	0	10	10	100	0	0	0
Barnyardgrass	15	20	5	0	0	10	15	15	0	0	5	0	10	5	0
Cocklebur	100	90	100	100	15	75	90	95	0	65	25	55	100	45	0
Common Ragweed	100	80	100	85	35	100	100	90	0	100	100	100	20	0	0
Corn	5	5	5	5	0	10	10	5	0	5	5	0	10	5	0
Cotton	100	100	100	100	30	100	95	100	10	80	100	100	80	80	20
Estrn Blknight	100	100	80	40	5	100	95	100	0	75	50	90	100	40	5
Fall Panicum	5	10	5	0	0	40	10	5	0	0	5	0	5	0	0
Field Bindweed	100	95	100	25	15	90	100	100	0	100	20	60	100	60	0
Fl Beggarweed	40	60	20	-	0	40	65	55	0	35	25	25	10	0	0
Giant Foxtail	10	10	5	5	0	15	10	10	0	5	5	10	5	0	0
Hairy Beggartic	85	35	100	30	0	65	95	85	0	15	65	90	60	10	0
Ivyleaw Mrnglry	100	100	100	30	0	80	100	100	0	20	35	95	100	65	0
Johnsongrass	0	10	5	5	0	10	15	10	0	0	5	0	5	5	0
Ladysthumb	30	50	20	20	20	25	30	35	0	10	25	15	10	0	0
Lambsquarters	55	65	65	80	50	65	100	85	0	55	-	-	75	10	10
Large Crabgrass	10	10	5	5	5	10	10	10	0	5	5	5	10	5	0
Purple Nutsedge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Redroot Pigweed	100	100	95	100	25	100	-	-	0	100	100	100	100	50	10
Soybean	25	35	25	25	0	10	25	25	0	15	10	10	20	20	0
Surinam Grass	10	10	5	10	0	15	10	10	0	0	10	5	5	10	0
Velvetleaf	100	100	100	45	10	100	100	100	0	100	100	100	100	50	0
Wild Poinsettia	100	95	100	100	15	100	100	100	0	75	80	95	100	95	0

Table F COMPOUND

Rate 2 g/ha	21	22	23	25	30	32	39	40	48	52	53	54	71
PREEMERGENCE													
Arrowleaw Sida	0	0	0	20	0	65	0	85	0	0	60	100	0
Barnyardgrass	0	0	0	0	0	0	0	0	0	0	0	0	0
Cocklebur	0	-	0	0	0	35	0	0	0	0	0	0	0
Common Ragweed	0	20	0	15	0	55	0	0	0	30	70	55	0
Corn	0	0	0	0	0	0	0	0	0	0	0	0	0
Cotton	0	0	0	0	0	20	100	-	0	0	0	0	0
Estrn Blknight	-	-	-	100	60	30	-	-	0	60	90	80	-
Fall Panicum	0	0	0	0	0	0	0	0	0	0	0	0	0
Field Bindweed	45	0	-	20	0	100	100	90	0	15	100	100	0
Fl Beggarweed	0	0	-	20	0	10	35	20	0	0	0	100	0
Giant Foxtail	0	0	0	0	0	0	0	0	0	0	0	0	0
Hairy Beggartic	-	30	20	15	0	15	100	80	0	-	20	100	0
Ivyleaw Mrnglry	-	0	0	25	0	40	0	0	0	25	0	25	0
Johnsongrass	0	0	0	0	0	0	0	0	0	0	0	0	0
Ladysthumb	-	10	0	10	-	20	-	0	0	0	0	50	0
Lambsquarters	0	35	50	80	30	85	-	-	0	25	0	90	0
Large Crabgrass	10	0	0	0	0	0	0	0	0	0	0	0	0
Purple Nutsedge	0	-	-	0	0	0	0	0	0	0	0	0	0
Redroot Pigweed	100	100	100	25	-	40	45	95	0	50	15	80	0
Soybean	0	0	0	0	0	0	0	0	0	0	0	0	0
Surinam Grass	0	0	0	0	0	0	0	0	0	0	0	0	0
Velvetleaf	30	0	10	30	0	30	15	15	0	20	50	75	0
Wild Poinsettia	10	0	10	0	0	80	10	20	0	0	20	100	0

Table F		COMPOUND												
Rate 1 g/ha	21	22	25	30	32	39	40	48	52	53	54	64	69	71
POSTEMERGENCE														
Arrowleaw Sida	60	40	10	0	0	60	30	0	0	0	10	0	0	0
Barnyardgrass	10	10	0	0	10	10	10	0	0	0	0	5	5	0
Cocklebur	100	80	35	0	60	80	80	0	0	15	40	75	40	0
Common Ragweed	30	55	20	10	20	75	65	0	40	45	60	0	0	0
Corn	0	0	0	0	10	5	5	0	0	0	0	10	5	0
Cotton	100	90	65	10	85	100	80	0	35	100	80	80	40	15
Estrn Blknight	100	90	5	0	100	85	80	0	20	30	25	85	5	0
Fall Panicum	0	5	0	0	30	5	0	0	0	0	0	0	0	0
Field Bindweed	75	55	15	0	85	90	100	0	85	-	15	80	25	0
Fl Beggarweed	25	50	20	0	15	50	35	0	-	15	5	5	0	0
Giant Foxtail	5	10	0	0	10	10	10	0	5	0	5	0	0	0
Hairy Beggartic	30	25	15	0	45	60	75	0	0	15	20	40	10	0
Ivyleaf Mrnglry	80	95	10	0	70	70	90	0	10	25	30	95	30	0
Johnsongrass	0	0	5	0	10	5	5	0	0	0	0	0	5	0
Ladysthumb	25	20	10	10	25	25	20	0	0	20	0	5	0	0
Lambsquarters	40	40	75	35	50	90	80	0	40	-	-	45	10	0
Large Crabgrass	5	5	0	0	10	5	5	0	0	0	0	10	5	0
Purple Nutsedge	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Redroot Pigweed	90	95	100	20	100	-	-	0	50	20	100	100	20	0
Soybean	20	25	10	0	0	15	15	0	5	5	5	20	20	0
Surinam Grass	10	5	10	0	10	5	5	0	0	5	5	5	5	0
Velvetleaf	100	90	20	0	50	75	100	0	20	70	100	100	30	0
Wild Poinsettia	80	80	35	10	80	95	95	0	45	90	50	95	40	0

Table F		COMPOUND										
Rate 1 g/ha	21	22	25	30	32	39	40	48	52	53	54	71
PREEMERGENCE												
Arrowleaw Sida	0	0	0	0	60	0	20	0	0	50	95	0
Barnyardgrass	0	0	0	0	0	0	0	0	0	0	0	0
Cocklebur	0	0	0	0	25	0	0	0	0	0	0	0
Common Ragweed	0	10	0	0	55	0	0	0	0	-	50	0
Corn	0	0	0	0	0	-	0	0	0	0	0	0
Cotton	0	0	0	0	20	0	-	0	0	0	0	0
Estrn Blknight	-	-	50	50	30	-	-	0	40	90	65	0
Fall Panicum	0	0	0	0	0	0	0	0	0	0	0	0
Field Bindweed	0	0	0	0	50	20	0	0	0	0	45	0
Fl Beggarweed	-	0	0	-	10	0	-	0	0	-	30	0
Giant Foxtail	0	0	0	0	0	0	0	0	0	0	0	0
Hairy Beggartic	0	20	0	0	15	20	30	0	0	0	30	0
Ivyleaw Mrnglry	0	0	10	0	30	0	0	0	10	0	25	0
Johnsongrass	0	-	0	0	0	0	0	0	0	0	0	0
Ladysthumb	-	-	-	0	-	0	-	0	0	-	0	0
Lambsquarters	0	15	75	10	80	-	-	0	0	0	90	0
Large Crabgrass	0	0	0	0	0	0	0	0	0	0	0	0
Purple Nutsedge	-	0	0	0	0	0	0	0	0	0	0	0
Redroot Pigweed	60	0	15	0	40	20	90	0	15	0	20	0
Soybean	0	-	0	0	0	0	0	0	0	0	0	0
Surinam Grass	0	0	0	0	0	0	0	0	0	0	0	0
Velvetleaf	0	0	0	0	15	0	0	0	10	10	60	0
Wild Poinsettia	0	0	0	0	60	0	0	0	0	20	100	0

TEST G

Seeds, tubers, or plant parts of alexandergrass (*Brachiaria plantaginea*), bermudagrass (*Cynodon dactylon*), broadleaf signalgrass (*Brachiaria plantyphylla*), common purslane (*Portulaca oleracea*), common ragweed (*Ambrosia elatior*), cotton (*Gossypium hirsutum*), dallisgrass (*Paspalum dilatatum*), goosegrass (*Eleusine indica*), guineagrass (*Panicum maximum*), itchgrass (*Rottboellia exaltata*), johnson grass (*Sorghum halepense*), large crabgrass (*Digitaria sanguinalis*), peanuts (*Arachis hypogaea*), pitted morningglory (*Ipomoea lacunosa*), purple nutsedge (*Cyperus rotundus*), sandbur (*Cenchrus echinatus*), sourgrass (*Trichachne insularis*), and surinam grass (*Brachiaria decumbens*) were planted into greenhouse pots or flats containing greenhouse planting medium. Plant species were grown in separate pots or individual compartments. Preemergence applications were made within one day of planting the seed or plant part. Postemergence applications were applied when the plants were in the two to four leaf stage (three to twenty cm).

Test chemicals were formulated in a non-phytotoxic solvent mixture which included a surfactant and applied preemergence and postemergence to the plants. Untreated control plants and treated plants were placed in the greenhouse and visually evaluated for injury 13 to 21 days after herbicide application. Plant response ratings, summarized in Table G, are based on a 0 to 100 scale where 0 is no injury and 100 is complete control. A dash (-) response means no test result.

Table G	COMPOUND			
Rate 250 g/ha	21	23	52	57
POSTEMERGENCE				
Alexandergrass	30	0	0	0
Bermudagrass	0	20	0	0
Brdlf Sgnlgrass	100	75	0	0
Cmn Purslane	100	100	100	95
Cmn Ragweed	100	100	-	-
Cotton	100	100	100	98
Dallisgrass	25	20	35	0
Goosegrass	0	0	0	0
Guineagrass	60	0	0	0
Itchgrass	60	-	-	-
Johnson grass	50	0	40	0
Large Crabgrass	5	20	0	0
Peanuts	40	10	10	0
Pit Morninglory	100	100	100	75
Purple Nutsedge	10	10	0	0
Sandbur	20	40	65	-
Sourgrass	100	40	0	0
Sugarcane	-	-	-	-
Surinam grass	30	0	0	20

Table G	COMPOUND			
Rate 250 g/ha	21	23	52	57
PREEMERGENCE				
Alexandergrass	65	0	0	0
Bermudagrass	50	0	0	0
Brdlf Sgnlgrass	100	70	60	0
Cmn Purslane	100	100	100	100
Cmn Ragweed	100	100	100	-
Cotton	100	100	100	0
Dallisgrass	65	30	10	0
Goosegrass	98	40	20	0
Guineagrass	0	0	25	0
Itchgrass	35	-	0	0
Johnson grass	65	0	0	0
Large Crabgrass	40	0	0	0
Peanuts	10	20	10	20
Pit Morninglory	100	100	100	40
Purple Nutsedge	60	60	60	0
Sandbur	100	35	25	60
Sourgrass	100	100	70	0
Sugarcane	-	-	-	-
Surinam grass	70	65	65	0

Table G	COMPOUND
Rate 125 g/ha	57
POSTEMERGENCE	
Alexandergrass	0
Bermudagrass	0
Brdlf Sgnlgrass	0
Cmn Purslane	85
Cmn Ragweed	30
Cotton	75
Dallisgrass	0
Goosegrass	0
Guineagrass	0
Itchgrass	-
Johnson grass	0
Large Crabgrass	0
Peanuts	0
Pit Morninglory	60
Purple Nutsedge	0
Sandbur	-
Sourgrass	0
Sugarcane	-
Surinam grass	0

Table G	COMPOUND
Rate 125 g/ha	57
PREEMERGENCE	
Alexandergrass	0
Bermudagrass	0
Brdlf Sgnlgrass	0
Cmn Purslane	100
Cmn Ragweed	0
Cotton	0
Dallisgrass	0
Goosegrass	0
Guineagrass	0
Itchgrass	0
Johnson grass	0
Large Crabgrass	0
Peanuts	0
Pit Morninglory	0
Purple Nutsedge	0
Sandbur	0
Sourgrass	0
Sugarcane	-
Surinam grass	0

Table G	COMPOUND	
Rate 64 g/ha	22	57
POSTEMERGENCE		
Alexandergrass	10	0
Bermudagrass	80	0
Brdlf Sgnlgrass	90	0
Cmn Purslane	100	80
Cmn Ragweed	100	30
Cotton	100	50
Dallisgrass	70	0
Goosegrass	60	0
Guineagrass	45	0
Itchgrass	25	-
Johnson grass	20	0
Large Crabgrass	60	0
Peanuts	10	0
Pit Morninglory	100	50
Purple Nutsedge	98	0
Sandbur	45	-
Sourgrass	0	0
Sugarcane	-	-
Surinam grass	10	0

Table G	COMPOUND	
Rate 64 g/ha	22	57
PREEMERGENCE		
Alexandergrass	10	0
Bermudagrass	0	0
Brdlf Sgnlgrass	0	0
Cmn Purslane	100	0
Cmn Ragweed	100	0
Cotton	100	0
Dallisgrass	45	0
Goosegrass	0	0
Guineagrass	10	0
Itchgrass	0	0
Johnson grass	45	0
Large Crabgrass	30	0
Peanuts	30	98
Pit Morninglory	100	0
Purple Nutsedge	10	0
Sandbur	0	0
Sourgrass	0	0
Sugarcane	-	-
Surinam grass	0	0

Table G	COMPOUND
Rate 35 g/ha	21
POSTEMERGENCE	
Alexandergrass	-
Bermudagrass	-
Brdlf Sgnlgrass	-
Cmn Purslane	-
Cmn Ragweed	-
Cotton	-
Dallisgrass	-
Goosegrass	-
Guineagrass	-
Itchgrass	-
Johnson grass	-
Large Crabgrass	-
Peanuts	15
Pit Morninglory	-
Purple Nutsedge	-
Sandbur	-
Sourgrass	-
Sugarcane	15
Surinam grass	-

Table G	COMPOUND
Rate 35 g/ha	21
PREEMERGENCE	
Alexandergrass	-
Bermudagrass	-
Brdlf Sgnlgrass	-
Cmn Purslane	-
Cmn Ragweed	-
Cotton	-
Dallisgrass	-
Goosegrass	-
Guineagrass	-
Itchgrass	-
Johnson grass	-
Large Crabgrass	-
Peanuts	40
Pit Morninglory	-
Purple Nutsedge	-
Sandbur	-
Sourgrass	-
Sugarcane	10
Surinam grass	-

Table G	COMPOUND
Rate 32 g/ha	57
POSTEMERGENCE	
Alexandergrass	0
Bermudagrass	0
Brdlf Sgnlgrass	0
Cmn Purslane	75
Cmn Ragweed	30
Cotton	0
Dallisgrass	0
Goosegrass	0
Guineagrass	0
Itchgrass	-
Johnson grass	0
Large Crabgrass	0
Peanuts	0
Pit Morninglory	40
Purple Nutsedge	0
Sandbur	-
Sourgrass	0
Sugarcane	-
Surinam grass	0

Table G	COMPOUND
Rate 32 g/ha	57
PREEMERGENCE	
Alexandergrass	0
Bermudagrass	0
Brdlf Sgnlgrass	0
Cmn Purslane	0
Cmn Ragweed	0
Cotton	0
Dallisgrass	0
Goosegrass	0
Guineagrass	0
Itchgrass	0
Johnson grass	0
Large Crabgrass	0
Peanuts	30
Pit Morninglory	0
Purple Nutsedge	0
Sandbur	0
Sourgrass	0
Sugarcane	-
Surinam grass	0

Table G	COMPOUND
Rate 17.5 g/ha	21
POSTEMERGENCE	
Alexandergrass	-
Bermudagrass	-
Brdlf Sgnlgrass	-
Cmn Purslane	-
Cmn Ragweed	-
Cotton	-
Dallisgrass	-
Goosegrass	-
Guineagrass	-
Itchgrass	-
Johnson grass	-
Large Crabgrass	-
Peanuts	10
Pit Morninglory	-
Purple Nutsedge	-
Sandbur	-
Sourgrass	-
Sugarcane	65
Surinam grass	-

Table G	COMPOUND
Rate 17.5 g/ha	21
PREEMERGENCE	
Alexandergrass	-
Bermudagrass	-
Brdlf Sgnlgrass	-
Cmn Purslane	-
Cmn Ragweed	-
Cotton	-
Dallisgrass	-
Goosegrass	-
Guineagrass	-
Itchgrass	-
Johnson grass	-
Large Crabgrass	-
Peanuts	30
Pit Morninglory	-
Purple Nutsedge	-
Sandbur	-
Sourgrass	-
Sugarcane	20
Surinam grass	-

Table G	COMPOUND
Rate 16 g/ha	57
POSTEMERGENCE	
Alexandergrass	0
Bermudagrass	0
Brdlf Sgnlgrass	0
Cmn Purslane	65
Cmn Ragweed	20
Cotton	0
Dallisgrass	0
Goosegrass	0
Guineagrass	0
Itchgrass	-
Johnson grass	0
Large Crabgrass	0
Peanuts	0
Pit Morninglory	35
Purple Nutsedge	0
Sandbur	-
Sourgrass	-
Sugarcane	-
Surinam grass	0

Table G	COMPOUND
Rate 16 g/ha	57
PREEMERGENCE	
Alexandergrass	0
Bermudagrass	0
Brdlf Sgnlgrass	0
Cmn Purslane	0
Cmn Ragweed	-
Cotton	0
Dallisgrass	0
Goosegrass	0
Guineagrass	0
Itchgrass	0
Johnson grass	0
Large Crabgrass	0
Peanuts	0
Pit Morninglory	0
Purple Nutsedge	0
Sandbur	0
Sourgrass	0
Sugarcane	-
Surinam grass	0

Table G	COMPOUND	
Rate 8 g/ha	21	57
POSTEMERGENCE		
Alexandergrass	-	0
Bermudagrass	-	0
Brdlf Sgnlgrass	-	0
Cmn Purslane	-	60
Cmn Ragweed	-	20
Cotton	-	0
Dallisgrass	-	0
Goosegrass	-	0
Guineagrass	-	0
Itchgrass	-	-
Johnson grass	-	0
Large Crabgrass	-	0
Peanuts	20	0
Pit Morninglory	-	30
Purple Nutsedge	-	0
Sandbur	-	-
Sourgrass	-	0
Sugarcane	15	-
Surinam grass	-	0

Table G	COMPOUND	
Rate 8 . g/ha	21	57
PREEMERGENCE		
Alexandergrass	-	0
Bermudagrass	-	0
Brdlf Sgnlgrass	-	0
Cmn Purslane	-	0
Cmn Ragweed	-	-
Cotton	-	0
Dallisgrass	-	0
Goosegrass	-	0
Guineagrass	-	0
Itchgrass	-	0
Johnson grass	-	0
Large Crabgrass	-	0
Peanuts	35	0
Pit Morninglory	-	0
Purple Nutsedge	-	0
Sandbur	-	0
Sourgrass	-	0
Sugarcane	0	-
Surinam grass	-	0

Table G	COMPOUND	
Rate 4 g/ha	21	57
POSTEMERGENCE		
Alexandergrass	-	0
Bermudagrass	-	0
Brdlf Sgnlgrass	-	0
Cmn Purslane	-	50
Cmn Ragweed	-	10
Cotton	-	-
Dallisgrass	-	0
Goosegrass	-	0
Guineagrass	-	0
Itchgrass	-	-
Johnson grass	-	0
Large Crabgrass	-	0
Peanuts	15	0
Pit Morninglory	-	30
Purple Nutsedge	-	0
Sandbur	-	-
Sourgrass	-	0
Sugarcane	10	-
Surinam grass	-	0

Table G	COMPOUND	
Rate 4 g/ha	21	57
PREEMERGENCE		
Alexandergrass	-	0
Bermudagrass	-	0
Brdlf Sgnlgrass	-	0
Cmn Purslane	-	-
Cmn Ragweed	-	0
Cotton	-	0
Dallisgrass	-	0
Goosegrass	-	0
Guineagrass	-	0
Itchgrass	-	0
Johnson grass	-	0
Large Crabgrass	-	0
Peanuts	20	0
Pit Morninglory	-	0
Purple Nutsedge	-	0
Sandbur	-	0
Sourgrass	-	0
Sugarcane	0	-
Surinam grass	-	0

Table G	COMPOUND
Rate 2 g/ha	21
POSTEMERGENCE	
Alexandergrass	-
Bermudagrass	-
Brdlf Sgnlgrass	-
Cmn Purslane	-
Cmn Ragweed	-
Cotton	-
Dallisgrass	-
Goosegrass	-
Guineagrass	-
Itchgrass	-
Johnson grass	-
Large Crabgrass	-
Peanuts	15
Pit Morninglory	-
Purple Nutsedge	-
Sandbur	-
Sourgrass	-
Sugarcane	5
Surinam grass	-

Table G	COMPOUND
Rate 2 g/ha	21
PREEMERGENCE	
Alexandergrass	-
Bermudagrass	-
Brdlf Sgnlgrass	-
Cmn Purslane	-
Cmn Ragweed	-
Cotton	-
Dallisgrass	-
Goosegrass	-
Guineagrass	-
Itchgrass	-
Johnson grass	-
Large Crabgrass	-
Peanuts	20
Pit Morninglory	-
Purple Nutsedge	-
Sandbur	-
Sourgrass	-
Sugarcane	0
Surinam grass	-

TEST H

Compounds evaluated in this test were formulated in a non-phytoxic solvent mixture which included a surfactant and applied to the soil surface before plant seedlings emerged (preemergence application) and to plants that were grown for various periods of time before treatment (postemergence application). A sandy loam soil was used for the preemergence test while a mixture of sandy loam soil and greenhouse potting mix in a 60:40 ratio was used for the postemergence test. Test compounds were applied within approximately one day after planting seeds for the preemergence test, and 13 days after the last postemergence planting.

Plantings of these crops and weed species were adjusted to produce plants of appropriate size for the postemergence test. All plant species were grown using normal greenhouse practices. Crop and weed species include Acanthospermum hispidum, alexandergrass (*Brachiaria plantaginea*), american black nightshade (*Solanum americanum*), apple-of-Peru (*Nicandra physaloides*), arrowleaf sida (*Sida rhombifolia*), brazilian sicklepod (*Cassia tora Brazilian*), brazilian signalgrass (*Brachiaria decumbens*), capim-colchao (*Digitaria horizontalis*), cristalina soybean (*Glycine max Cristalina*), florida beggarweed (*Desmodium purpureum*), hairy beggarticks (*Bidens pilosa*), slender amaranth (*Amaranthus viridis*), southern sandur (*Cenchrus echinatus*), tall morningglory (*Ipomoea purpurea*), tropical spiderwort (*Commelina benghalensis*), W20 Soybean (Glycine max W20), W4-4 Soybean (Glycine max W4-4) and wild pointsettia (*Eupohorbia heterophylla*).

Treated plants and untreated controls were maintained in a greenhouse for approximately 13 days, after which all treated plants were compared to untreated controls and visually evaluated. Plant response ratings, summarized in Table H, are based upon a 0 to 100 scale where 0 is no effect and 100 is complete control. A dash response (-) means no test result.

Table H	COMPOUND
Rate 35 g/ha	21
POSTEMERGENCE	
Acanthospermum	100
Alexandergrass	20
Apple-of-Peru	70
Arrowleaf Sida	100
B. Signalgrass	10
Bl. Nightshade	100
Braz Sicklepod	40
Capim-Colch	5
Crist. Soybean	60
Fl. Beggarweed	100
H. Beggarticks	100
Morningglory	100
Sl. Amaranth	85
Southern Sandur	10
Tr. Spiderwort	100
Wld Pointsettia	100
W20 Soybean	35
W4-4 Soybean	35

Table H	COMPOUND
Rate 35 g/ha	21
PREEMERGENCE	
Acanthospermum	100
Alexandergrass	5
Apple-of-Peru	100
Arrowleaf Sida	100
B. Signalgrass	30
Bl. Nightshade	100
Braz Sicklepod	75
Capim-Colch	10
Crist. Soybean	10
Fl. Beggarweed	100
H. Beggarticks	100
Morningglory	100
Sl. Amaranth	100
Southern Sandur	75
Tr. Spiderwort	100
Wld Pointsettia	100
W20 Soybean	5
W4-4 Soybean	5

Table H	COMPOUND			
Rate 17 g/ha	21	23	25	32
POSTEMERGENCE				
Acanthospermum	100	100	100	100
Alexandergrass	15	45	25	20
Apple-of-Peru	60	100	85	100
Arrowleaf Sida	100	100	85	100
B. Signalgrass	5	80	45	25
Bl. Nightshade	85	100	100	100
Braz Sicklepod	30	60	40	20
Capim-Colch	5	55	50	40
Crist. Soybean	50	70	25	30
Fl. Beggarweed	85	100	75	80
H. Beggarticks	100	100	100	100
Morningglory	85	100	100	100
Sl. Amaranth	75	100	85	80
Southern Sandur	5	-	-	-
Tr. Spiderwort	100	100	100	-
Wld Pointsettia	100	100	100	100
W20 Soybean	30	50	20	30
W4-4 Soybean	30	45	30	30

Table H	COMPOUND
Rate 17 g/ha	21
PREEMERGENCE	
Acanthospermum	100
Alexandergrass	5
Apple-of-Peru	100
Arrowleaf Sida	100
B. Signalgrass	25
Bl. Nightshade	100
Braz Sicklepod	20
Capim-Colch	10
Crist. Soybean	5
Fl. Beggarweed	100
H. Beggarticks	100
Morningglory	100
Sl. Amaranth	100
Southern Sandur	40
Tr. Spiderwort	100
Wld Pointsettia	100
W20 Soybean	5
W4-4 Soybean	5

Table H	COMPOUND			
Rate 8 g/ha	21	23	25	32
POSTEMERGENCE				
Acanthospermum	80	100	85	80
Alexandergrass	10	35	20	20
Apple-of-Peru	55	100	80	100
Arrowleaf Sida	85	100	80	100
B. Signalgrass	5	55	40	20
Bl. Nightshade	75	100	100	100
Braz Sicklepod	20	60	20	15
Capim-Colch	5	55	30	30
Crist. Soybean	15	60	25	20
Fl. Beggarweed	75	75	60	65
H. Beggarticks	100	100	100	100
Morningglory	80	100	100	100
Sl. Amaranth	70	100	75	75
Southern Sandur	5	-	-	-
Tr. Spiderwort	80	100	60	-
Wld Pointsettia	100	100	100	100
W20 Soybean	10	35	15	25
W4-4 Soybean	15	35	20	25

Table H	COMPOUND
Rate 8 g/ha	21
PREEMERGENCE	
Acanthospermum	100
Alexandergrass	5
Apple-of-Peru	100
Arrowleaf Sida	100
B. Signalgrass	20
Bl. Nightshade	100
Braz Sicklepod	15
Capim-Colch	5
Crist. Soybean	0
Fl. Beggarweed	100
H. Beggarticks	100
Morningglory	90
Sl. Amaranth	100
Southern Sandur	10
Tr. Spiderwort	70
Wld Pointsettia	100
W20 Soybean	5
W4-4 Soybean	5

Table H	COMPOUND			
Rate 4 g/ha	21	23	25	32
POSTEMERGENCE				
Acanthospermum	80	100	80	75
Alexandergrass	5	30	15	15
Apple-of-Peru	50	100	80	100
Arrowleaf Sida	70	100	70	100
B. Signalgrass	0	50	40	20
Bl. Nightshade	65	100	100	100
Braz Sicklepod	0	20	0	15
Capim-Colch	5	55	25	30
Crist. Soybean	15	50	20	15
Fl. Beggarweed	55	55	50	65
H. Beggarticks	85	100	100	100
Morningglory	75	100	100	100
Sl. Amaranth	70	80	75	75
Southern Sandur	5	-	-	-
Tr. Spiderwort	70	100	60	-
Wld Pointsettia	100	100	100	100
W20 Soybean	10	25	15	20
W4-4 Soybean	10	30	20	20

Table H	COMPOUND
Rate 4 g/ha	21
PREEMERGENCE	
Acanthospermum	100
Alexandergrass	0
Apple-of-Peru	55
Arrowleaf Sida	0
B. Signalgrass	20
Bl. Nightshade	100
Braz Sicklepod	10
Capim-Colch	0
Crist. Soybean	0
Fl. Beggarweed	100
H. Beggarticks	75
Morningglory	85
Sl. Amaranth	100
Southern Sandur	5
Tr. Spiderwort	60
Wld Pointsettia	100
W20 Soybean	5
W4-4 Soybean	5

Table H	COMPOUND			
Rate 2 g/ha	21	23	25	32
POSTEMERGENCE				
Acanthospermum	60	100	70	60
Alexandergrass	0	25	10	10
Apple-of-Peru	40	100	60	-
Arrowleaf Sida	65	100	55	100
B. Signalgrass	0	40	20	20
Bl. Nightshade	55	100	85	100
Braz Sicklepod	0	20	0	15
Capim-Colch	5	15	25	30
Crist. Soybean	15	30	55	10
Fl. Beggarweed	50	35	50	55
H. Beggarticks	70	100	60	70
Morningglory	70	100	70	80
Sl. Amaranth	60	75	55	70
Southern Sandur	0	-	-	-
Tr. Spiderwort	70	100	15	-
Wld Pointsettia	80	100	70	100
W20 Soybean	10	20	10	15
W4-4 Soybean	10	25	15	15

Table H	COMPOUND
Rate 2 g/ha	21
PREEMERGENCE	
Acanthospermum	60
Alexandergrass	0
Apple-of-Peru	55
Arrowleaf Sida	0
B. Signalgrass	15
Bl. Nightshade	85
Braz Sicklepod	-
Capim-Colch	0
Crist. Soybean	0
Fl. Beggarweed	100
H. Beggarticks	60
Morningglory	55
Sl. Amaranth	100
Southern Sandur	0
Tr. Spiderwort	50
Wld Pointsettia	80
W20 Soybean	0
W4-4 Soybean	5

Table H	COMPOUND			
Rate 1 g/ha	21	23	25	32
POSTEMERGENCE				
Acanthospermum	60	100	70	40
Alexandergrass	10	20	10	10
Apple-of-Peru	90	100	55	100
Arrowleaf Sida	80	80	55	75
B. Signalgrass	0	30	15	10
Bl. Nightshade	70	80	80	100
Braz Sicklepod	15	15	50	10
Capim-Colch	0	10	20	15
Crist. Soybean	25	25	10	10
Fl. Beggarweed	15	70	20	55
H. Beggarticks	80	100	60	55
Morningglory	50	100	70	70
Sl. Amaranth	75	75	55	50
Southern Sandur	-	-	-	-
Tr. Spiderwort	65	80	10	-
Wld Pointsettia	75	75	100	100
W20 Soybean	20	15	0	15
W4-4 Soybean	25	20	10	20

TEST I

Compounds evaluated in this test were formulated in a non-phytotoxic solvent mixture and applied to the surface of the water which was contained in each pot. Individual containers of barnyardgrass (*Echinochloa oryzicola*), small flower umbrella sedge (*Cyperus difformus*), common falsepimpernel (*Lindernia procumbens*), monochoria (*Monochoria vaginalis*) and bulrush (*Scirpus juncoides*) were seeded and allowed to grow until the 1.5 to 2.5 leaf stage of development. A Sultama clay loam soil was used for this propagation. Japonica rice (*Oryza sativa*) was transplanted at 0 and 2 cm depth five days before application of the test compound to the water surface. An early and late stage of each weed species was treated, the stage of development being related to the concurrent planting of Scirpus juncoides which was then treated at the 1.5 (early) and the 2.5 (late) leaf stage.

Treated plants and untreated controls were maintained under greenhouse conditions for twenty to thirty days at which time treated plants were compared to untreated controls and visually evaluated. Plant response ratings, summarized in Table I, are based upon a 0 to 100 scale where 0 is no effect and 100 is complete control. A dash response (-) indicated that no test result was recorded.

Table I	COMPOUND		
Rate 250 g/ha	11	13	21
Flood Saita soi			
	-	-	-
barnyard early	0	100	95
barnyard late	30	100	90
C. difformis ea	100	100	100
C. difformis la	50	100	100
Japoni rice 0cm	10	85	80
Japoni rice 2cm	20	55	50
L. procumben ea	70	100	100
L. procumben la	100	100	100
M. vaginalis ea	20	80	100
M. vaginalis la	20	100	100
S. juncoides 1.	60	80	90
S. juncoides 2.	40	85	65

Table I	COMPOUND		
Rate 125 g/ha	11	13	21
Flood Saita soi			
	-	-	-
barnyard early	0	90	85
barnyard late	0	70	85
C. difformis ea	40	100	100
C. difformis la	30	50	100
Japoni rice 0cm	10	80	50
Japoni rice 2cm	25	40	30
L. procumben ea	0	100	100
L. procumben la	20	85	100
M. vaginalis ea	0	75	100
M. vaginalis la	20	50	85
S. juncoides 1.	30	65	75
S. juncoides 2.	40	50	55

Table I	COMPOUND		
Rate 64 g/ha	11	13	21
Flood Saita soi			
	N	N	-
barnyard early	0	60	65
barnyard late	0	50	60
C. difformis ea	0	100	100
C. difformis la	10	40	100
Japoni rice 0cm	30	60	35
Japoni rice 2cm	0	25	20
L. procumben ea	0	100	100
L. procumben la	0	95	100
M. vaginalis ea	0	40	100
M. vaginalis la	0	40	85
S. juncoides 1.	30	40	50
S. juncoides 2.	0	20	50

Table I	COMPOUND		
Rate 32 g/ha	11	13	21
Flood Saita soi			
	I	L	L
barnyard early	0	30	60
barnyard late	0	40	50
C. difformis ea	0	70	100
C. difformis la	0	30	60
Japoni rice 0cm	5	50	0
Japoni rice 2cm	0	20	5
L. procumben ea	0	100	100
L. procumben la	0	100	100
M. vaginalis ea	0	30	100
M. vaginalis la	0	10	70
S. juncoides 1.	40	30	0
S. juncoides 2.	0	20	30

TEST J

Plastic pots were partially filled with silt loam soil. The soil was then saturated with water. Rice (*Oryza sativa*) seed or seedlings at the 2.0 to 3.5 leaf stage; seeds, tubers or plant parts selected from barnyardgrass (*Echinochloa crus-galli*), common waterplantain (*Alisma plantago-aquatica*), ducksalad (*Heteranthera limosa*), early watergrass (*Echinochloa oryzoides*), gooseweed (*Sphenoclea zeylanica*), junglerice (*Echinochloa colonum*), late watergrass (*Echinochloa oryzicola*), monochoria (*Monochoria vaginalis*), redstem (*Ammania species*), rice flatsedge (*Cyperus iria*), ricefield bulrush (*Scirpus mucronatus*), smallflower flatsedge (*Cyperus difformis*), tighthead sprangletop (*Leptochloa fasicularis*) and water-clover (*Marsilea quadrifolia*) into this soil. Plantings and waterings of these crops and weed species were adjusted to produce plants of appropriate size for the test. At the two leaf stage, water levels were raised to 3 cm above the soil surface and maintained at this level throughout the test. Chemical treatments were formulated in a non-phytotoxic solvent mixture which included a surfactant and applied directly to the paddy water, by pipette, or to the plant foliage, by an air-pressure assisted, calibrated belt-conveyer spray system.

Treated plants and controls were maintained in a greenhouse for approximately 21 days, after which all species were compared to controls and visually evaluated. Plant response ratings, summarized in Table J, are reported on a 0 to 100 scale where 0 is no effect and 100 is complete control. A dash (-) response means no test result.

Table J	COMPOUND				
Rate 1000 g/ha	12	21	25	39	40
PD/TA					
barnyardgrass	60	-	-	-	-
ducksalad	100	0	20	60	50
early watergras	-	-	-	-	-
gooseweed	-	100	-	100	95
junglerice	65	-	-	-	-
late watergrass	70	-	-	-	-
monochoria	-	65	-	85	65
redstem	100	10	0	40	30
rice flatsedge	100	85	80	75	90
ricefield bulru	-	60	-	65	50
smallflower fla	100	0	0	0	40
tighthead spran	0	0	20	30	25
water-clover	-	75	75	60	45
A. plantago-aqu	-	100	-	90	100
2 LF direct see	30	15	20	20	40
2 LF transp. in	45	10	15	15	35

Table J	COMPOUND			
Rate 750 g/ha	21	25	39	40
PD/TA				
barnyardgrass	-	-	-	-
ducksalad	0	0	60	0
early watergras	-	-	-	-
gooseweed	90	100	85	85
junglerice	-	-	-	-
late watergrass	-	-	-	-
monochoria	55	60	60	55
redstem	0	0	30	20
rice flatsedge	75	75	80	90
ricefield bulru	60	60	60	35
smallflower fla	0	0	0	30
tighthead spran	0	60	0	40
water-clover	85	20	45	50
A. plantago-aqu	100	100	98	100
2 LF direct see	15	20	10	35
2 LF transp. in	10	15	10	25

Table J	COMPOUND				
Rate 500 g/ha	12	21	25	39	40
PD/TA					
barnyardgrass	40	-	-	-	-
ducksalad	100	0	0	30	10
early watergras	-	-	-	-	-
gooseweed	-	98	85	80	85
junglerice	45	-	-	-	-
late watergrass	45	-	-	-	-
monochoria	-	55	45	40	60
redstem	100	0	0	0	20
rice flatsedge	100	55	60	30	20
ricefield bulru	-	50	30	60	40
smallflower fla	100	0	0	0	0
tighthead spran	65	0	0	0	40
water-clover	-	45	15	40	60
A. plantago-aqu	-	100	90	90	90
2 LF direct see	35	15	15	10	20
2 LF transp. in	35	10	10	10	20

Table J	COMPOUND			
Rate 375 g/ha	21	25	39	40
PD/TA				
barnyardgrass	-	-	-	-
ducksalad	20	0	0	0
early watergras	-	-	-	-
gooseweed	80	45	90	85
junglerice	-	-	-	-
late watergrass	-	-	-	-
monochoria	40	40	25	40
redstem	0	0	0	10
rice flatsedge	35	30	70	15
ricefield bulru	40	15	65	35
smallflower fla	0	0	0	0
tighthead spran	0	0	0	0
water-clover	40	10	20	10
A. plantago-aqu	90	45	100	85
2 LF direct see	15	10	10	20
2 LF transp. in	10	10	10	20

Table J	COMPOUND				
Rate 250 g/ha	12	21	25	39	40
PD/TA					
barnyardgrass	35	30	-	-	-
ducksalad	100	60	0	0	0
early watergras	-	35	-	-	-
gooseweed	-	60	75	75	60
junglerice	35	-	-	-	-
late watergrass	25	35	-	-	-
monochoria	-	35	40	25	30
redstem	95	85	0	0	10
rice flatsedge	95	98	30	20	60
ricefield bulru	-	30	10	20	10
smallflower fla	90	65	10	0	0
tighthead spran	50	20	0	10	0
water-clover	-	40	10	20	10
A. plantago-aqu	-	90	30	60	60
2 LF direct see	15	10	10	15	20
2 LF transp. in	20	10	0	10	20

Table J	COMPOUND	
Rate 125 g/ha	12	21
PD/TA		
barnyardgrass	15	15
ducksalad	80	40
early watergras	-	45
gooseweed	-	-
junglerice	40	-
late watergrass	20	30
monochoria	-	-
redstem	75	55
rice flatsedge	85	85
ricefield bulru	-	-
smallflower fla	95	60
tighthead spran	40	45
water-clover	-	-
A. plantago-aqu	-	-
2 LF direct see	20	15
2 LF transp. in	20	0

Table J	COMPOUND	
Rate 64 g/ha	12	21
PD/TA		
barnyardgrass	10	0
ducksalad	50	20
early watergras	-	15
gooseweed	-	-
junglerice	35	-
late watergrass	10	25
monochoria	-	-
redstem	10	40
rice flatsedge	80	98
ricefield bulru	-	-
smallflower fla	90	55
tighthead spran	30	0
water-clover	-	-
A. plantago-aqu	-	-
2 LF direct see	15	10
2 LF transp. in	10	0

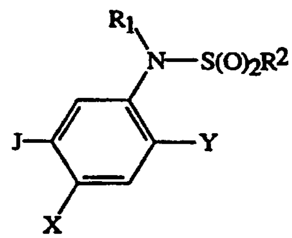
Table J	COMPOUND
Rate 32 g/ha	21
PD/TA	
barnyardgrass	0
ducksalad	0
early watergras	0
gooseweed	-
junglerice	-
late watergrass	0
monochoria	-
redstem	35
rice flatsedge	40
ricefield bulru	-
smallflower fla	30
tighthead spran	0
water-clover	-
A. plantago-aqu	-
2 LF direct see	0
2 LF transp. in	0

Table J	COMPOUND
Rate 16 g/ha	21
PD/TA	
barnyardgrass	0
ducksalad	0
early watergras	20
gooseweed	-
junglerice	-
late watergrass	15
monochoria	-
redstem	25
rice flatsedge	20
ricefield bulru	-
smallflower fla	30
tighthead spran	75
water-clover	-
A. plantago-aqu	-
2 LF direct see	10
2 LF transp. in	10

CLAIMS

What is claimed is:

1. A compound selected from Formula I, *N*-oxides and agriculturally suitable salts thereof,



I

wherein

X is H, F or Cl;

Y is F, Cl, Br, cyano, nitro, C_1-C_3 haloalkyl, C_1-C_3 alkoxy, C_1-C_3 haloalkoxy or C(S)NH_2;

R^1 is H, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 alkenyl, C_3-C_6 haloalkenyl, C_3-C_6 alkynyl, C_3-C_6 haloalkynyl, C_2-C_6 alkoxyalkyl, C_2-C_6 haloalkoxyalkyl, formyl, C_2-C_{20} alkylcarbonyl, C_4-C_7 cycloalkylcarbonyl, C_2-C_6 haloalkylcarbonyl, C_2-C_6 alkoxycarbonyl, C_3-C_6 alkoxyalkylcarbonyl, C_2-C_6 haloalkoxycarbonyl, C_3-C_6 cycloalkyl, C_3-C_6 halocycloalkyl, C_4-C_7 cycloalkylalkyl, C_4-C_7 halocycloalkylalkyl, $S(O)_2R^2$, C(O)SR^3, C(O)NR^4R^5 or benzoyl;

R^2 is C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, C_1-C_6 haloalkyl, C_3-C_6 cylcloalkyl, C_3-C_6 halocycloalkyl, C_2-C_6 alkoxyalkyl, C_2-C_6 haloalkoxyalkyl, C_2-C_6 alkenyl, C_2-C_6 haloalkenyl, C_3-C_6 alkoxyalkenyl, C_2-C_6 alkynyl, C_2-C_6 haloalkynyl, C_2-C_6 cyanoalkyl, C_1-C_6 nitroalkyl, $(CH_2)_p$-OR^6, CH=CH$(CH_2)_q$-OR^6, C≡C$(CH_2)_q$-OR^6, C_2-C_6 alkylthioalkyl, C_2-C_6 alkylsulfinylalkyl, C_2-C_6 alkylsulfonylalkyl, C_3-C_8 alkoxycarbonylalkyl, C_3-C_8 alkylcarbonyloxyalkyl or oxiranyl optionally substituted with 1-3 C_1-C_3 alkyl;

R^3 is H, C_1-C_3 alkyl or C_1-C_3 haloalkyl; or R^3 is phenyl optionally substituted with C_1-C_3 alkyl, 1-3 halogen, 4-5 fluorine, 1-2 nitro, C_1-C_3 alkoxy or CF_3;

R^4 is H, C_1-C_3 alkyl or C_1-C_3 haloalkyl; or R^4 is phenyl optionally substituted with C_1-C_3 alkyl, 1-3 halogen, 4-5 fluorine, 1-2 nitro, C_1-C_3 alkoxy or CF_3;

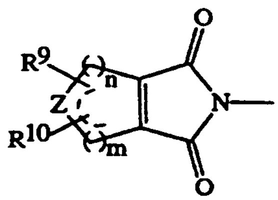
R^5 is C_1-C_3 alkyl or C_1-C_3 haloalkyl; or

R^4 and R^5 are taken together as -CH-CH_2-, -$CH_2CH_2CH_2$-, -$CH_2CH_2CH_2CH_2$-, -$CH_2CH_2CH_2CH_2CH_2$- or -$CH_2CH_2OCH_2CH_2$-;

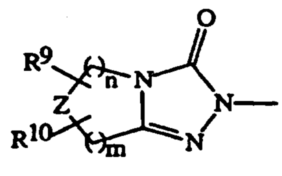
R^6 is C_1-C_3 alkylsulfonyl, C_1-C_3 haloalkylsulfonyl or $P(=O)(OR^7)(OR^8)$; or R^6 is phenylsulfonyl optionally substituted with C_1-C_6 alkyl, 1-3 halogen, 4-5 fluorine, C_1-C_6 alkoxy, CF_3 or C_2-C_4 alkylcarbonyl;

R^7 and R^8 are each independently H, C_1-C_3 alkyl or C_1-C_3 haloalkyl;

J is



J-1



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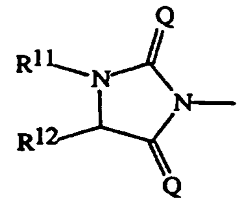

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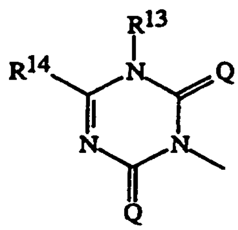
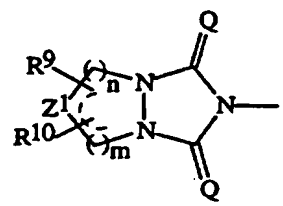
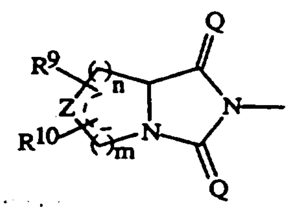


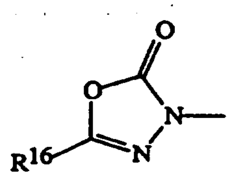
J-4



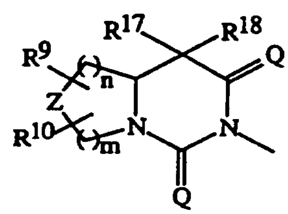
J-5



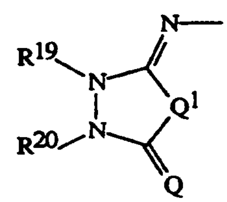
J-6



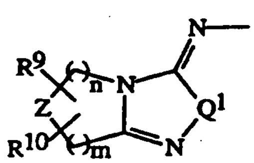
J-7



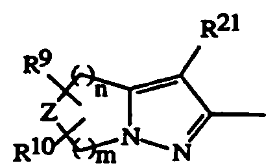
J-8



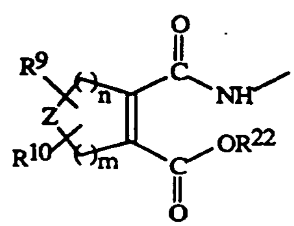
J-9



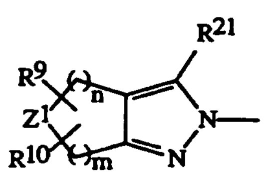
J-10



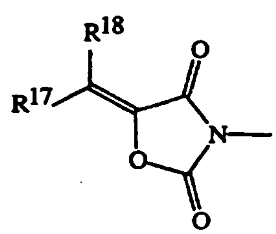
J-11



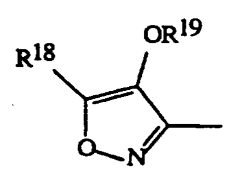
J-12



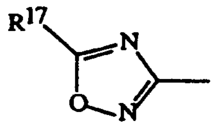
J-13



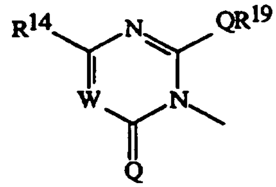
J-14



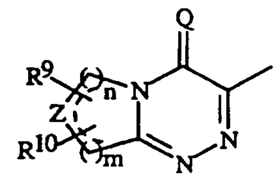
J-15



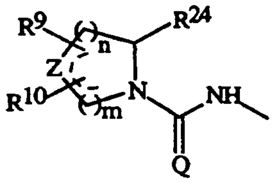
J-16



J-17



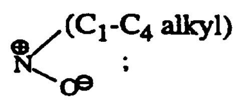
J-18

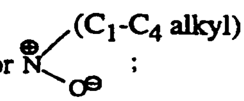


J-19

wherein the dashed line in J-1, J-5, J-6, J-18, and J-19 indicates that the left-hand ring contains only single bonds or one bond in the ring is a carbon-carbon double bond;

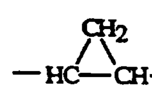
m and n are each independently 0, 1, 2 or 3, provided that m + n is 2 or 3;

Z is CR^9R^{10}, O, S, S(O), $S(O)_2$, N(C_1-C_4 alkyl) or  ;

Z^1 is CR^9R^{23}, O, S, S(O), $S(O)_2$, N(C_1-C_4 alkyl) or  ;

each R^9 is independently H, C_1-C_6 alkyl, halogen, hydroxy, C_1-C_6 alkoxy, C_1-C_6 haloalkyl, C_1-C_6 haloalkoxy, C_2-C_6 alkylcarbonyloxy or C_2-C_6 haloalkylcarbonyloxy;

each R^{10} is independently H, C_1-C_6 alkyl, hydroxy or halogen; or

when R^9 and R^{10} are bonded to adjacent carbon atoms they can be taken together with the carbons to which they are attached to form  optionally substituted with at least one member selected from 1-2 halogen and 1-2 C_1-C_3 alkyl;

each R^{11} is independently H, C_1-C_6 alkyl, C_3-C_6 alkenyl, C_1-C_6 haloalkyl or C_2-C_6 alkoxyalkyl;

R^{12} is H, halogen, C_1-C_6 alkyl, C_3-C_6 alkenyl, C_1-C_6 haloalkyl or C_2-C_6 alkoxyalkyl;

R^{13} is H, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 alkenyl, C_3-C_6 haloalkenyl, C_3-C_6 alkynyl, C_3-C_6 haloalkynyl, HC(=O), C_2-C_5 alkylcarbonyl or $N(R^{11})_2$;

R^{14} is C_1-C_6 alkyl, C_1-C_6 alkylthio, C_1-C_6 haloalkyl or $N(CH_3)_2$;

W is N or CR^{15};

R^{15} is H, C_1-C_6 alkyl or halogen; or R^{15} is phenyl optionally substituted with C_1-C_6 alkyl, 1-3 halogen, 4-5 fluorine, C_1-C_6 alkoxy or CF_3;

R^{16} is C_1-C_6 alkyl, halogen or C_1-C_6 haloalkyl;

R^{17} and R^{18} are each independently H, C_1-C_6 alkyl or C_1-C_6 haloalkyl;

R^{19} and R^{20} are each independently C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 alkenyl, C_3-C_6 haloalkenyl, C_3-C_6 alkynyl or C_3-C_6 haloalkynyl;

R^{21} is H, halogen, cyano, C_1-C_3 alkoxy or C_1-C_3 haloalkoxy;

R^{22} is C_1-C_6 alkyl or C_1-C_6 haloalkyl; or R^{22} is phenyl optionally substituted with C_1-C_6 alkyl, 1-3 halogen, 4-5 fluorine, 1-2 nitro, C_1-C_6 alkoxy or CF_3;

R^{23} is C_1-C_3 alkyl, hydroxy or halogen;

R^{24} is cyano or $C(Q)R^{25}$;

R^{25} is OR^{26} or $NR^{27}R^{28}$;

R^{26} is C_1-C_6 alkyl or C_1-C_6 haloalkyl;

each R^{27} is independently H or C_1-C_6 alkyl;

R^{28} is H, C_1-C_6 alkyl, C_1-C_6 alkoxy or $NR^{27}R^{29}$; or

R^{27} and R^{28} can be taken together as $-CH_2CH_2-$, $-CH_2CH_2CH_2-$, $-CH_2CH_2CH_2CH_2-$, $-CH_2CH_2CH_2CH_2CH_2-$ or $-CH_2CH_2OCH_2CH_2-$;

R^{29} is H, C_1-C_3 alkyl, C_2-C_4 alkylcarbonyl, C_2-C_4 alkoxycarbonyl or C_1-C_3 alkylsulfonyl;

Q is independently O or S;

Q^1 is O or S;

p is 1, 2 or 3; and

q is 0, 1, 2 or 3;

provided that,

(a) when J is J-5, X is F, Y is Cl, R^1 is H, Q is O, R^9 and R^{10} are H, Z^1 is O, n is 2, and m is 1, then R^2 is other than CF_3;

(b) when J is J-6, X is F, Y is Cl, R^1 is H, Q is O, R^9 and R^{10} are H, Z is CHCl or CHBr, n is 1, and m is 1, then R^2 is other than CF_3;

(c) when J is J-8, X is F, Y is Cl, R^1 is H, R^{17} and R^{18} are H, Q is O, R^9 and R^{10} are H, Z is CH_2, and (m+n) is 2 or 3, then R^2 is other than CF_3;

(d) when J is J-8, X is F, Y is Cl, R^1 is H, R^{17} and R^{18} are H, Q is O, R^9 and R^{10} are H, Z is O, n is 1, and m is 2, then R^2 is other than CF_3; and

(e) when J is J-11, X is F, Y is Cl, R^1 is H, R^{21} is Cl, R^9 and R^{10} are H, Z is CH_2, and (m+n) is 3, then R^2 is other than CF_3.

2. A compound of Claim 1 wherein:

X is F or Cl;

Y is F, Cl or Br;

R^1 is H, C_1-C_6 alkyl, C_3-C_6 cycloalkyl, C_3-C_6 alkenyl, C_3-C_6 alkynyl, C_1-C_6 haloalkyl, C_2-C_6 alkoxyalkyl, C_3-C_6 haloalkenyl, C_3-C_6 alkoxyalkylcarbonyl, C_2-C_6 alkylcarbonyl, C_2-C_6 alkoxycarbonyl, $S(O)_2R^2$ or $C(O)NR^4R^5$;

R^2 is C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, C_1-C_6 haloalkyl, C_3-C_6 cylcloalkyl, C_3-C_6 halocycloalkyl, C_2-C_6 alkoxyalkyl or C_2-C_6 haloalkoxyalkyl;

J is J-5, J-6, J-11, J-17 or J-19;

Z is CR^9R^{10}, O, S or N(C_1-C_4 alkyl);

each R^9 is independently H, halogen or C_1-C_6 haloalkoxy;

each R^{10} is independently H, hydroxy or halogen;

each Q is O;

Z^1 is CR^9R^{23}, O, S or N(C_1-C_4 alkyl); and

R^{23} is halogen.

3. A compound of Claim 2 wherein:

Y is F or Cl;

R^1 is H, C_1-C_6 alkyl, C_3-C_6 cycloalkyl, C_3-C_6 alkenyl, C_3-C_6 alkynyl, C_1-C_6 haloalkyl, C_2-C_6 alkoxyalkyl, C_3-C_6 haloalkenyl, C_2-C_6 alkylcarbonyl or C_2-C_6 alkoxycarbonyl;

R^2 is C_1-C_6 haloalkoxy, C_1-C_6 haloalkyl, C_3-C_6 halocycloalkyl, C_2-C_6 alkoxyalkyl or C_2-C_6 haloalkoxyalkyl;

Z is CR^9R^{10} or O; and

Z^1 is CR^9R^{23} or O.

4. A compound of Claim 2 wherein:

J is J-19;

R^1 is H, C_1-C_6 alkyl, C_3-C_6 alkenyl, C_3-C_6 alkynyl, C_2-C_6 alkoxyalkyl, C_2-C_6 alkylcarbonyl or C_2-C_6 alkoxycarbonyl;

R^2 is C_1-C_6 haloalkyl;

R^9 is H;

R^{10} is hydroxy or halogen;

Z is CR^9R^{10};

n is 1; and

m is 1.

5. A compound of Claim 3 wherein:
J is J-6; and
Z is CR^9R^{10}.

6. The compound of Claim 5 which is selected from the group:
a) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide;
b) (6*S*-*cis*)-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]-*N*-[(chloromethyl)sulfonyl]acetamide;
c) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide;
d) (6*S*-*cis*)-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl)-*N*-[(chloromethyl)sulfonyl]acetamide;
e) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide monosodium salt;
f) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-4-fluoro-5-(6-fluorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)phenyl]methanesulfonamide monopotassium salt;
g) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide monosodium salt; and
h) (6*S*-*cis*)-1-chloro-*N*-[2-chloro-5-(6-chlorotetrahydro-1,3-dioxo-1*H*-pyrrolo[1,2-*c*]imidazol-2(3*H*)-yl)-4-fluorophenyl]methanesulfonamide monopotassium salt.

7. A mixture comprising a herbicidally effective amount of a compound of Claim 6 with a herbicidally effective amount of one or more compounds selected from rimsulfuron, thifensulfuron-methyl, chlorimuron-ethyl, nicosulfuron, prosulfuron, primsulfuron, atrazine, terbuthylazine, dicamba, 2,4-D, bomoxynil, pyridate, sulcotrione, glufosinate, glyphosate, glyphosate-trimesium, fluthiacet-methyl, quizalofop-p-ethyl, bentazone, clopyralid, flumetsulam, halosulfuron, sethoxydim, flumiclorac-pentyl, imozamox, acetachlor, alachlor, dimethenamid, isoxaflutole, metolachlor, metribuzin, pendimethalin, thiafluimid, clethodim, fluazifop-p-butyl, haloxyfop, imazethapyr, imazaquin, lactofen, acifluorfen-sodium, oxasulfuron, imazameth, tribenuron-methyl, metsulfuron-methyl, chlorsulfuron, triasulfuron, bromoxynil, MCPA, fluroxypyr, fenoxaprop, fenchlorazole, diclofop, tralkoxydim, clodinafop, cloquintocet-mexyl, imazamethabenz, sulfosulfuron, difenzoquat, propanil, triallate, trifluralin, paraquat, diallate, linuron, diflufenican, cyanazine, neburon, terbutryn, prosulfocarb, isoproturon,

chlortoluron, methabenzthiazuron, metoxuron, simazine, ioxynil, mecoprop, metosulam, fluroglycophen-ethyl, flamprop-M-isopropyl, and benzoylpropethyl.

8. A herbicidal composition comprising a herbicidally effective amount of a compound of Claim 1 and at least one of a surfactant, a solid diluent or a liquid diluent.

9. A herbicidal composition comprising a herbicidally effective amount of a mixture of Claim 7 and at least one of a surfactant, a solid diluent or a liquid diluent.

10. A method for controlling the growth of undesired vegetation comprising contacting the vegetation or its environment with a herbicidally effective amount of a compound of Claim 1.

11. A method for controlling the growth of undesired vegetation comprising contacting the vegetation or its environment with a herbicidally effective amount of a mixture of Claim 7.

INTERNATIONAL SEARCH REPORT

Inter nal Application No
PCT/US 96/16111

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 C07D487/04 C07D471/04 C07D251/46 C07D209/48 C07D207/16
A01N43/90 A01N43/64 A01N47/38 //(C07D487/04,235:00,
209:00),(C07D471/04,235:00,221:00),(C07D471/04,249:00,221:00),

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 C07D A01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 077 938 A (MITSUBISHI) 4 May 1983 see claims 1,12	1,8
A	EP 0 364 797 A (BAYER) 25 April 1990 see claims 1,6	1,8
P,X	WO 95 29158 A (BAYER) 2 November 1995 see claims 1,8; example 24	1,8

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
"&" document member of the same patent family

1

Date of the actual completion of the international search	Date of mailing of the international search report
12 February 1997	20.02.97

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Alfaro Faus, I

INTERNATIONAL SEARCH REPORT

International Application No

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 (C07D487/04,239:00,209:00)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.

☐ Further documents are listed in the continuation of box C.

☐ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No.
PCT/US 96/16111

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
On grounds of Articles 6 and 17.2a(ii) of the PCT (conciseness of claims) and of the Guidelines for Examination in the EPO, Part B, Chapter III, 2.2 (economic reasons) the search has been restricted to a generalization of the preparation examples disclosed in the description.

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searches without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 96/16111

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A-77938	04-05-83	JP-A- 58072562	30-04-83
		JP-C- 1634028	20-01-92
		JP-B- 2057543	05-12-90
		JP-A- 58103363	20-06-83
		AU-A- 8946382	28-04-83
EP-A-364797	25-04-90	DE-A- 3835168	19-04-90
		DE-D- 58906982	24-03-94
		JP-A- 2164864	25-06-90
		US-A- 5069711	03-12-91
		US-A- 5221318	22-06-93
WO-A-9529158	02-11-95	DE-A- 4414568	02-11-95
		AU-A- 2308295	16-11-95
		CA-A- 2188796	02-11-95
		EP-A- 0757673	12-02-97